FCC Test Report (Part 96)

Report No.:	RF171205C30 R1
Test Model:	EM7565
FCC ID:	N7NEM75
Received Date:	Dec. 05, 2017
Test Date:	Dec. 14, 2017 ~ Dec. 15, 2017
Issued Date:	Sep. 14, 2018
Applicant:	Sierra Wireless, Inc.
Address:	13811 Wireless Way, Richmond, BC, Canada V6V 3A4
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF171205C30	Original release.	Dec. 15, 2017
RF171205C30 R1	Update Section 4.5.3	Sep. 14, 2018

1 Certificate of Conformity

Product:	Radio Module
Brand:	AirPrime
Test Model:	EM7565
Sample Status:	Identical Prototype
Applicant:	Sierra Wireless, Inc.
Test Date:	Dec. 14, 2017 ~ Dec. 15, 2017
Standards:	47 CFR FCC Part 96

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Evonne Liu , **Date:** Sep. 14, 2018

Evonne Liu / Specialist

Approved by : , **Date:** Sep. 14, 2018

Dylan Chiou / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 96			
FCC Clause	Test Item	Result	Remarks
2.1046 96.41(b)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1046 96.41(b)	Maximum Power Spectral Density	Pass	Meet the requirement of limit.
96.41(g)	Peak to Average Ration	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1055	Frequency Stability	Pass	Meet the requirement of limit.
2.1051 96.41(e)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 96.41(e)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -3.0dB at 30.97MHz.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Radio Module		
Brand	AirPrime		
Test Model	EM7565		
Status of EUT	Identical Prototype		
Power Supply Rating	5.0 Vdc (host equipment)		
Modulation Type	QPSK, 16QAM, 64QAM		
Operating Frequency	LTE	Channel Bandwidth 5MHz	TX: 3552.5 ~ 3697.5 MHz
			RX: 3552.5 ~ 3697.5 MHz
		Channel Bandwidth 10MHz	TX: 3555 ~ 3695 MHz
			RX: 3555 ~ 3695 MHz
		Channel Bandwidth 10MHz	TX: 3557.5 ~ 3692.5 MHz
			RX: 3557.5 ~ 3692.5 MHz
		Channel Bandwidth 20MHz	TX: 3560 ~ 3690 MHz
			RX: 3560 ~ 3690 MHz
Channel Bandwidth	LTE	5MHz, 10MHz, 15MHz, 20MHz in intra band contiguous spectrum operation	
Emission Designator	LTE	Channel Bandwidth 5MHz	QPSK: 4M45G7D
			16QAM: 4M45W7D
			64QAM: 4M45W7D
		Channel Bandwidth 10MHz	QPSK: 8M96G7D
			16QAM: 8M96W7D
			64QAM: 8M93W7D
		Channel Bandwidth 15MHz	QPSK: 13M4G7D
			16QAM: 13M4W7D
			64QAM: 13M4W7D
		Channel Bandwidth 20MHz	QPSK: 18M0G7D
			16QAM: 17M9W7D
			64QAM: 17M9W7D
Accessory Device	N/A		
Data Cable Supplied	N/A		

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

Channel Bandwidth (MHz)	Channel
5	Low
	Middle
	High
10	Low
	Middle
	High
15	Low
	Middle
	High
20	Low
	Middle
	High

3.2.1 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports
The worst case was found when positioned on Z-plane. Following channel(s) was (were) selected for the final test as listed below:

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
Maximum Output Power	3552.5 to 3697.5	3552.5, 3625, 3697.5	5MHz	QPSK, 16QAM, 64QAM
	3555 to 3695	3555, 3625, 3695	10MHz	QPSK, 16QAM, 64QAM
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK, 16QAM, 64QAM
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK, 16QAM, 64QAM
Frequency Stability	3552.5 to 3697.5	3552.5, 3625, 3697.5	5MHz	QPSK
	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK
Occupied Bandwidth	3552.5 to 3697.5	3552.5, 3625, 3697.5	5MHz	QPSK, 16QAM, 64QAM
	3555 to 3695	3555, 3625, 3695	10MHz	QPSK, 16QAM, 64QAM
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK, 16QAM, 64QAM
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK, 16QAM, 64QAM
Peak to Average Ratio	3552.5 to 3697.5	3552.5, 3625, 3697.5	5MHz	QPSK, 16QAM, 64QAM
	3555 to 3695	3555, 3625, 3695	10MHz	QPSK, 16QAM, 64QAM
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK, 16QAM, 64QAM
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK, 16QAM, 64QAM
Radiated Emission	3552.5 to 3697.5	3552.5, 3625, 3697.5	5MHz	QPSK
	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK
Conducted Emission	3552.5 to 3697.5	3552.5, 3625, 3697.5	5MHz	QPSK
	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
Maximum Output Power	25deg. C, 63%RH	120Vac, 60Hz	Koven Chuang
Frequency Stability	25deg. C, 63%RH	120Vac, 60Hz	Koven Chuang
Occupied Bandwidth	25deg. C, 63%RH	120Vac, 60Hz	Koven Chuang
Peak to Average Ratio	25deg. C, 63%RH	120Vac, 60Hz	Koven Chuang
Condcudeted Emission	25deg. C, 63%RH	120Vac, 60Hz	Koven Chuang
Radiated Emission	19deg. C, 63%RH	120Vac, 60Hz	James Yang

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
A.	Wideband Radio Communication Tester	R&S	CMW500	151084	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A

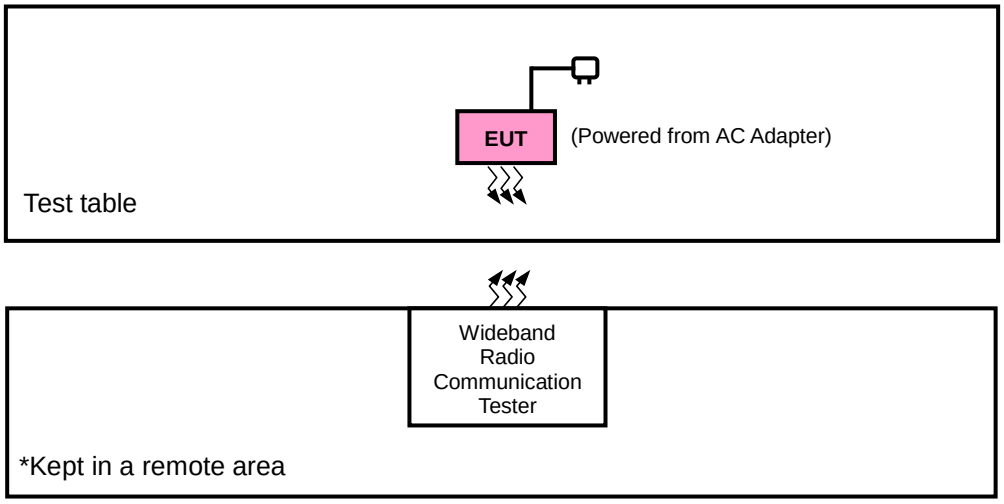
Note:

1. All power cords of the above support units are non-shielded (1.8m).

2. Items 1 acted as communication partners to transfer data.

3.3.1 Configuration of System under Test

<Radiated Emission Test>



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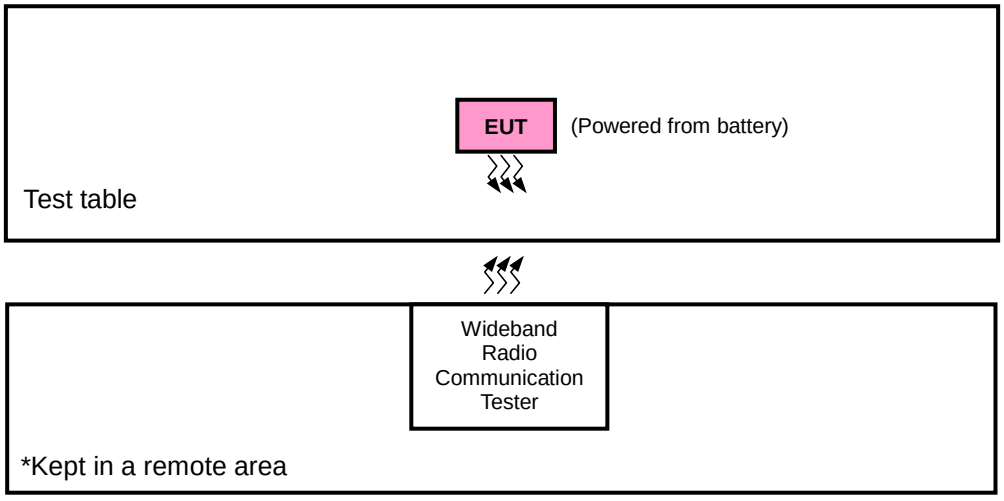


3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 96

KDB 971168 D01 Power Meas License Digital Systems v02r02

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI/TIA/EIA-603-D-2010

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

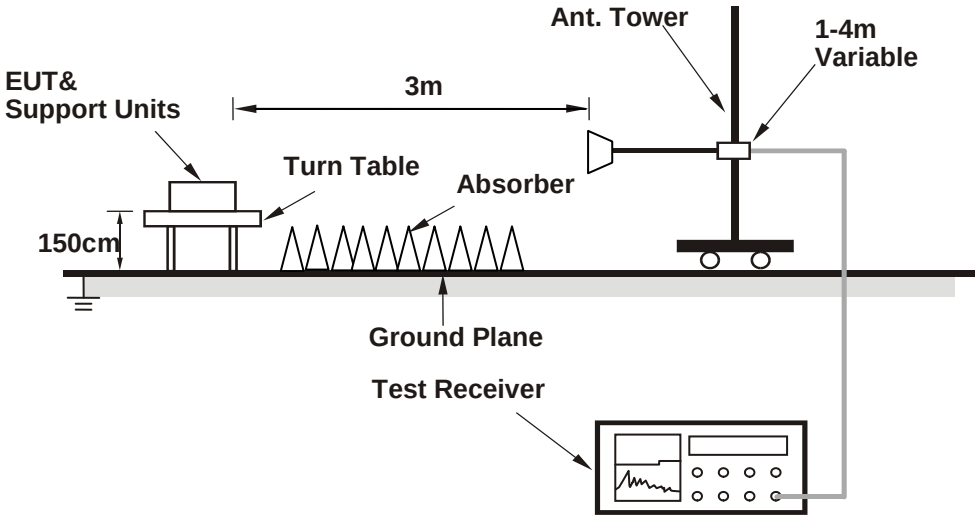
4.1 Maximum Output Power Measurement

4.1.1 Limits of Maximum Output Power Measurement

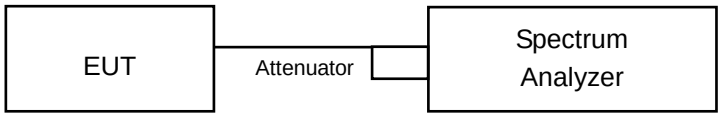
Device		Maximum Output Power (dBm/10 MHz)
☒	End User Device	23
☐	Category A CBSD	30
☐	Category B CBSD	47

4.1.2 Test Setup

Radiated Measurement Method



Conducted Measurement Method



4.1.3 Test Instruments

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Feb. 17, 2017	Feb. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 16, 2016	Dec. 15, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 26, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 12, 2016	Dec. 13, 2017
Double Ridge Guide Horn Antenna EMCO	3115	5619	Dec. 26, 2016	Dec. 27, 2017
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 12, 2016	Dec. 13, 2017
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 17, 2017	Apr. 16, 2018
MXG Vector signal generator Agilent	N5182B	MY53052282	Dec. 23, 2016	Dec. 22, 2017
Preamplifier EMCI	EMC 012645	980115	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 184045	980116	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 330H	980112	Oct. 20, 2017	Oct. 19, 2018
Power Meter Anritsu	ML2495A	1145013	Mar. 07, 2017	Mar. 06, 2018
Power Sensor Anritsu	MA2411B	1126085	Mar. 07, 2017	Mar. 06, 2018
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 20, 2017	Oct. 19, 2018
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 20, 2017	Oct. 19, 2018
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer	MT8820C	6201300640	Aug. 16, 2017	Aug. 15, 2019
Temperature & Humidity Chamber	GTH-120-40-CP-A R	MAA1306-019	Sep. 08, 2017	Sep. 07, 2018
DC Power Supply Topward	33010D	807748	Oct. 25, 2016	Oct. 24, 2018
Digital Multimeter Fluke	87-III	70360742	Jun. 30, 2017	Jun. 29, 2018

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450F-10.

4.1.4 Test Procedures

Radiated Measurement Method

1) The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5) The test-receiver system was set to peak and/or average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
6) EIRP = Output power level of S.G + Correction Factor (including Cable loss, Antenna gain, etc,…)

Conducted Measurement Method

1. Connect the DUT transmitter output to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
2. Set span to at least 1.5 times the OBW.
3. Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
4. Set VBW ≥ 3 × RBW.
5. Set number of points in sweep ≥ 2 × span / RBW.
6. Sweep time = auto-couple.
7. Detector = RMS (power averaging).
8. If the EUT can be configured to transmit continuously (i.e., burst duty cycle ≥ 98%), then set the trigger to free run.
9. If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98 %), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.
10. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
11. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

4.1.5 Deviation from Test Standard

No deviation.

4.1.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.1.7 Test Results

Conducted Output Power (dBm)

LTE Band 48

BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 55265 3552.5 MHz	Mid CH 55990 3625 MHz	High CH 56715 3697.5 MHz	3GPP MPR (dB)	Low CH 55265 3552.5 MHz	Mid CH 55990 3625 MHz	High CH 56715 3697.5 MHz	3GPP MPR (dB)	Low CH 55265 3552.5 MHz	Mid CH 55990 3625 MHz	High CH 56715 3697.5 MHz	3GPP MPR (dB)
5	1	0	20.95	21.71	21.55	0	19.89	21.23	20.67	1	18.84	20.16	19.64	2
	1	12	20.82	21.65	21.40	0	19.77	21.08	20.51	1	18.65	20.05	19.46	2
	1	24	20.67	21.38	21.18	0	19.58	21.01	20.39	1	18.62	19.84	19.36	2
	12	0	19.82	20.69	20.36	1	18.77	20.08	19.51	2	17.57	18.95	18.50	3
	12	6	19.71	20.44	20.25	1	18.60	19.91	19.33	2	17.55	18.79	18.31	3
	12	13	19.53	20.39	20.15	1	18.43	19.78	19.22	2	17.47	18.64	18.21	3
	25	0	19.78	20.66	20.32	1	18.69	20.07	19.55	2	17.67	19.01	18.49	3

BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 55290 3555 MHz	Mid CH 55990 3625 MHz	High CH 56690 3695 MHz	3GPP MPR (dB)	Low CH 55290 3555 MHz	Mid CH 55990 3625 MHz	High CH 56690 3695 MHz	3GPP MPR (dB)	Low CH 55290 3555 MHz	Mid CH 55990 3625 MHz	High CH 56690 3695 MHz	3GPP MPR (dB)
10	1	0	21.01	21.86	21.62	0	20.23	21.03	20.91	1	19.23	20.03	19.78	2
	1	24	20.92	21.73	21.51	0	20.08	20.90	20.75	1	19.10	19.88	19.67	2
	1	49	20.74	21.51	21.33	0	19.94	20.77	20.65	1	18.92	19.76	19.53	2
	25	0	19.84	20.68	20.56	1	19.13	19.91	19.81	2	18.12	18.92	18.66	3
	25	12	19.66	20.45	20.37	1	18.96	19.74	19.64	2	17.92	18.74	18.44	3
	25	25	19.56	20.42	20.30	1	18.83	19.57	19.48	2	17.85	18.66	18.34	3
	50	0	19.83	20.71	20.38	1	19.11	19.81	19.76	2	18.06	18.87	18.58	3

BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 55315 3557.5 MHz	Mid CH 55990 3625 MHz	High CH 56665 3692.5 MHz	3GPP MPR (dB)	Low CH 55315 3557.5 MHz	Mid CH 55990 3625 MHz	High CH 56665 3692.5 MHz	3GPP MPR (dB)	Low CH 55315 3557.5 MHz	Mid CH 55990 3625 MHz	High CH 56665 3692.5 MHz	3GPP MPR (dB)
15	1	0	21.07	21.87	21.65	0	17.84	18.65	18.34	1	16.68	17.57	17.15	2
	1	37	20.90	21.76	21.54	0	17.79	18.61	18.31	1	16.54	17.46	17.07	2
	1	74	20.80	21.52	21.26	0	17.75	18.63	18.21	1	16.32	17.27	16.87	2
	36	0	17.95	18.43	18.07	1	15.54	16.82	16.81	2	15.57	16.53	15.99	3
	36	19	17.91	18.31	17.95	1	15.51	16.73	16.79	2	15.35	16.35	15.81	3
	36	39	17.92	18.36	17.97	1	15.57	16.70	16.83	2	15.30	16.24	15.67	3
	75	0	18.16	18.58	17.74	1	15.47	16.67	16.67	2	15.57	16.50	16.11	3

BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 55340 3560 MHz	Mid CH 55990 3625 MHz	High CH 56640 3690 MHz	3GPP MPR (dB)	Low CH 55340 3560 MHz	Mid CH 55990 3625 MHz	High CH 56640 3690 MHz	3GPP MPR (dB)	Low CH 55340 3560 MHz	Mid CH 55990 3625 MHz	High CH 56640 3690 MHz	3GPP MPR (dB)
20	1	0	21.10	21.93	21.71	0	17.91	18.55	18.34	1	16.72	17.65	17.23	2
	1	50	21.00	21.80	21.55	0	17.89	18.45	18.31	1	16.56	17.56	17.08	2
	1	99	20.82	21.60	21.47	0	17.83	18.38	18.27	1	16.35	17.27	16.98	2
	50	0	17.91	18.56	18.23	1	15.56	16.89	16.55	2	15.61	16.54	16.09	3
	50	25	17.89	18.51	18.19	1	15.51	16.83	16.51	2	15.43	16.35	15.92	3
	50	50	17.75	18.49	18.14	1	15.45	16.81	16.45	2	15.35	16.27	15.79	3
	100	0	17.81	18.48	18.11	1	15.43	16.78	16.41	2	15.56	16.48	16.09	3

Channel	Freq. (MHz)	5MHz EIRP Power (dBm/10MHz)			Limit (dBm/10MHz)	Pass /Fail
		QPSK	16QAM	64QAM	Maximum	
Low	3552.5	21.15	20.35	19.26	23.0	Pass
Middle	3625	22.45	21.71	20.62	23.0	Pass
High	3697.5	21.75	21.09	20.07	23.0	Pass

Channel	Freq. (MHz)	10MHz EIRP Power (dBm/10MHz)			Limit (dBm/10MHz)	Pass /Fail
		QPSK	16QAM	64QAM	Maximum	
Low	3555	21.6	20.7	19.68	23.0	Pass
Middle	3625	22.4	21.58	20.55	23.0	Pass
High	3695	21.87	21.32	20.25	23.0	Pass

Channel	Freq. (MHz)	15MHz EIRP Power (dBm/10MHz)			Limit (dBm/10MHz)	Pass /Fail
		QPSK	16QAM	64QAM	Maximum	
Low	3557.5	21.34	18.25	17.22	23.0	Pass
Middle	3625	22.36	19.19	18.11	23.0	Pass
High	3692.5	22	18.74	17.68	23.0	Pass

Channel	Freq. (MHz)	20MHz EIRP Power (dBm/10MHz)			Limit (dBm/10MHz)	Pass /Fail
		QPSK	16QAM	64QAM	Maximum	
Low	3560	21.63	18.35	17.27	23.0	Pass
Middle	3625	22.5	19.16	18.15	23.0	Pass
High	3690	22.24	18.95	17.89	23.0	Pass

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency band.

4.2.2 Test Procedure

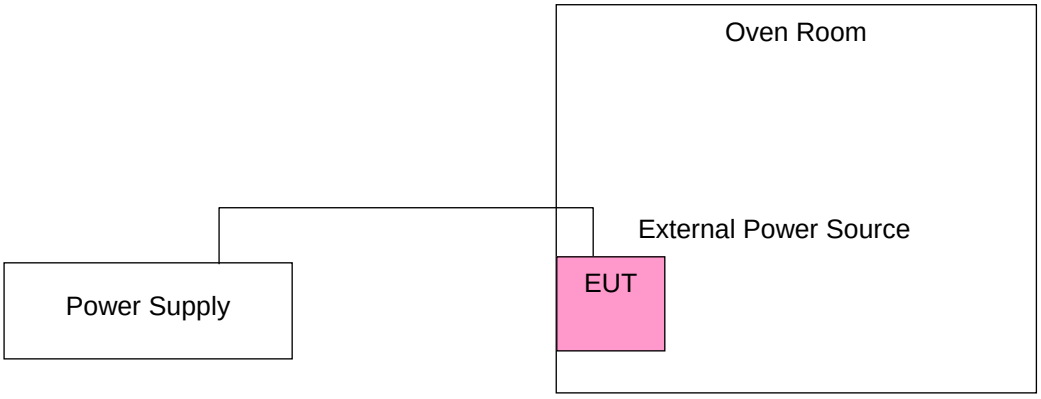
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the AC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (MHz)		Pass/Fail
	Frequency (Hz)	Frequency Error (ppm)	
3.135	13.9	0.004	Pass
4.4	18.3	0.005	Pass

Frequency Error vs. Temperature.

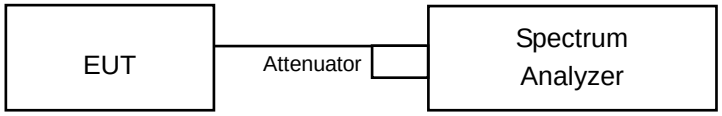
TEMP. (℃)	Frequency Error (MHz)		Pass/Fail
	Frequency (Hz)	Frequency Error (ppm)	
50	20.2	0.006	Pass
40	17.3	0.005	Pass
30	15.1	0.004	Pass
20	14.8	0.004	Pass
10	11.2	0.003	Pass
0	13.6	0.004	Pass
-10	18.3	0.005	Pass
-20	16.4	0.005	Pass
-30	12.7	0.004	Pass

4.3 Emission Bandwidth Measurement

4.3.1 Emission Bandwidth Measurement

Reference only

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.3.4 Test Procedure

Occupied Bandwdith:
All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

26dBc Bandwidth:
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW =51 kHz (5 MHz bandwidth), 100 kHz (10 MHz bandwidth), 200 kHz (15 MHz bandwidth), 430 kHz (20 MHz bandwidth). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.3.5 Deviation fromTest Standard

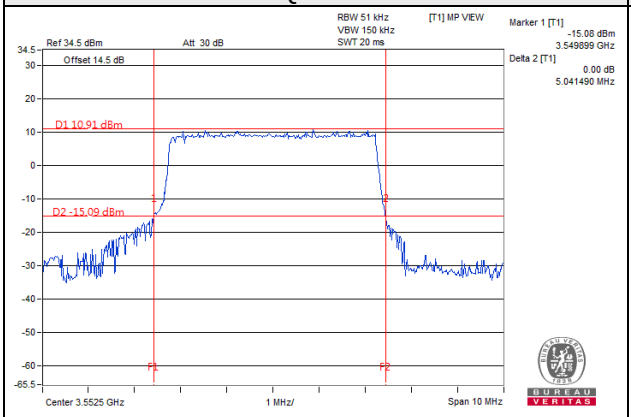
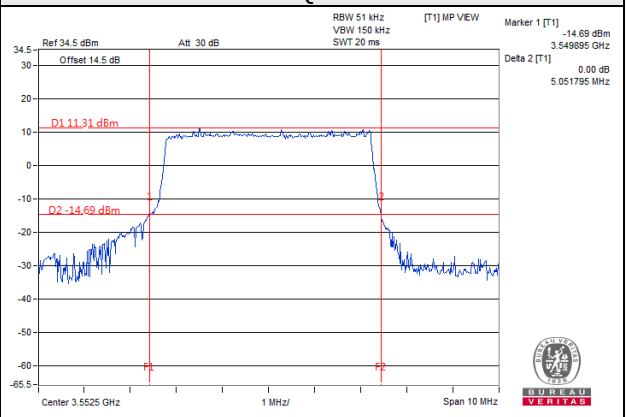
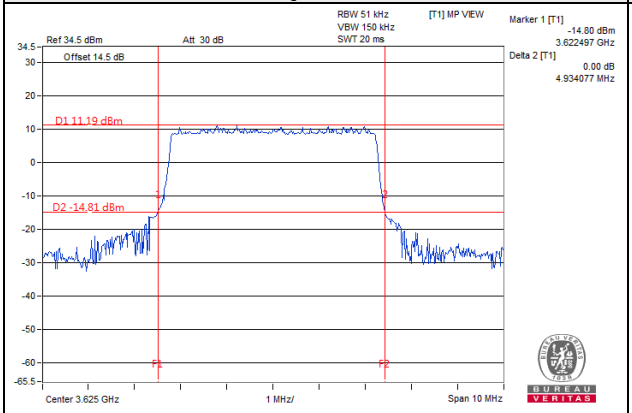
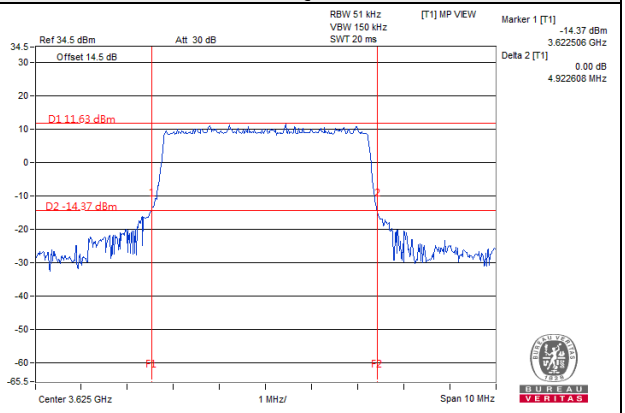
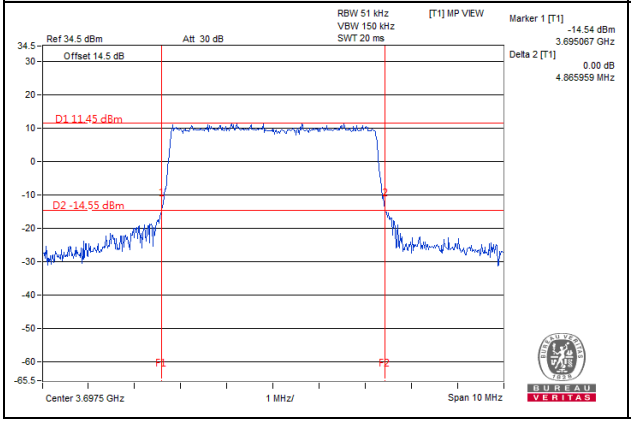
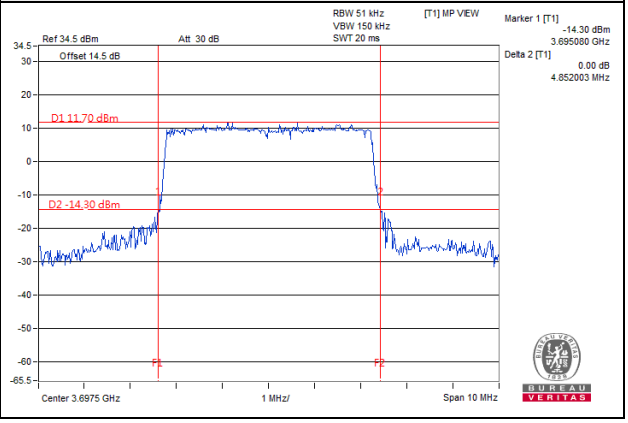
No deviation.

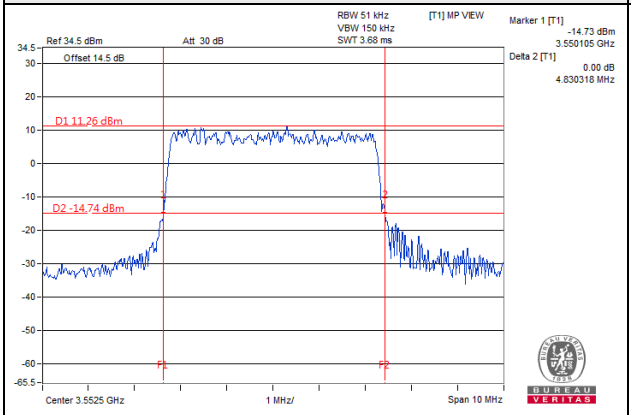
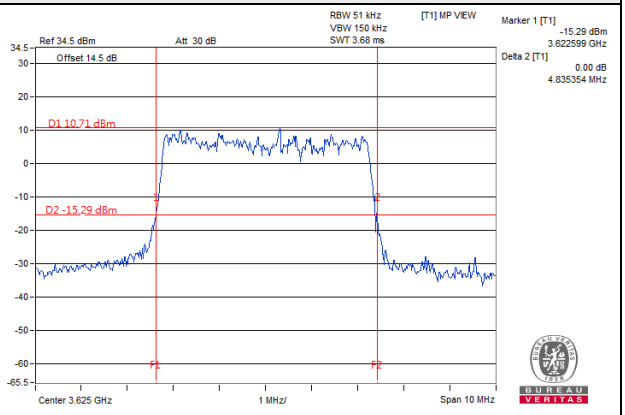
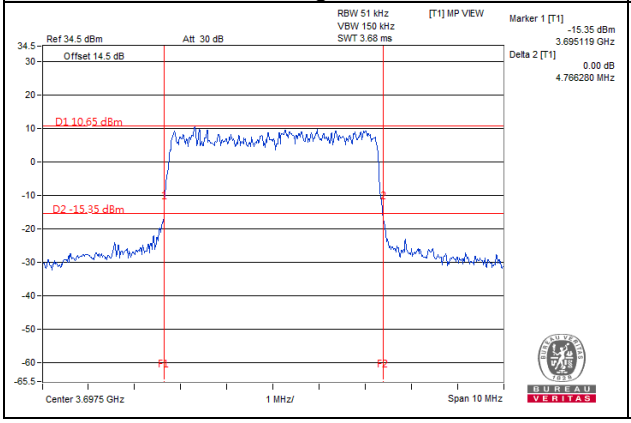
4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

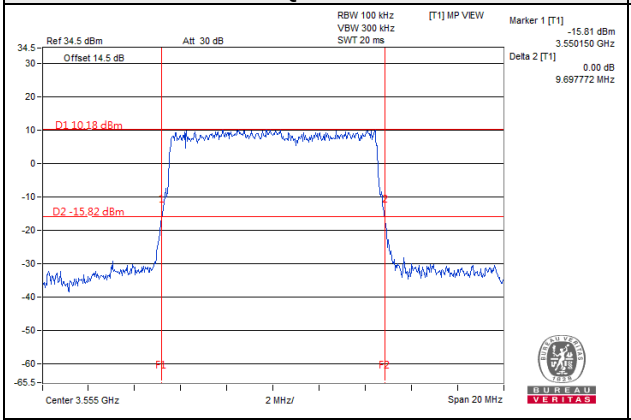
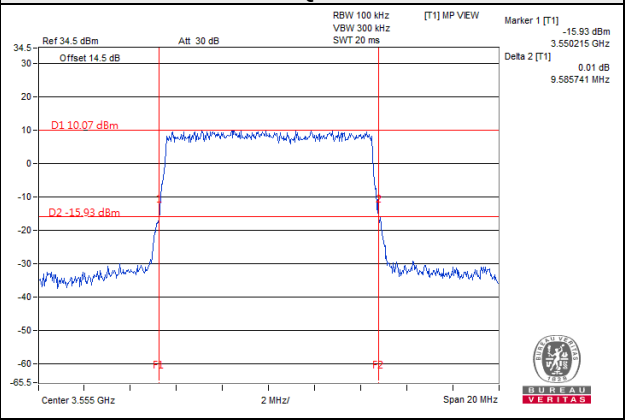
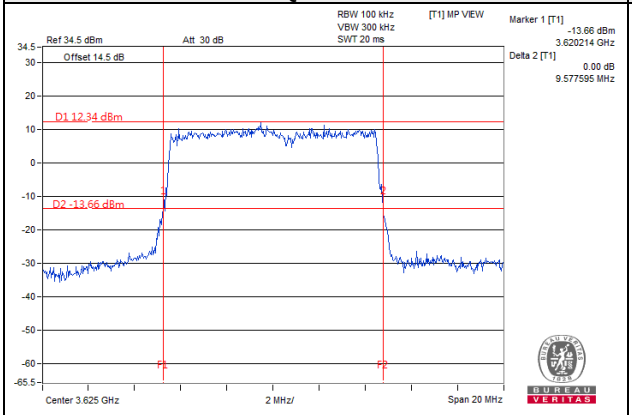
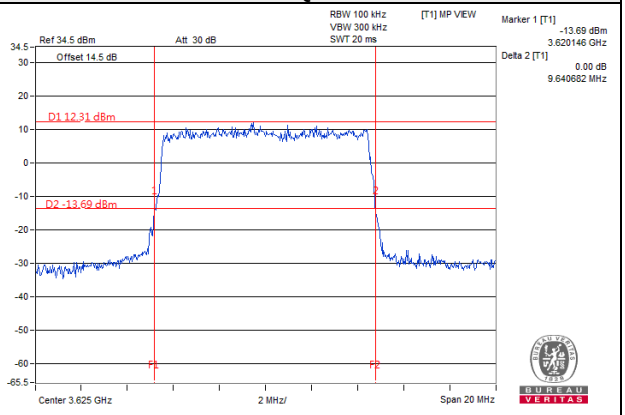
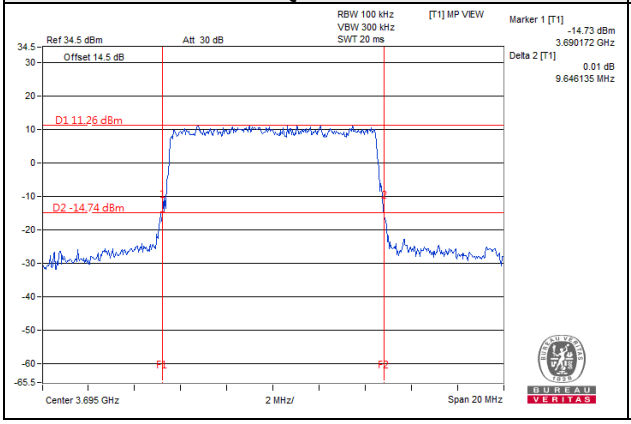
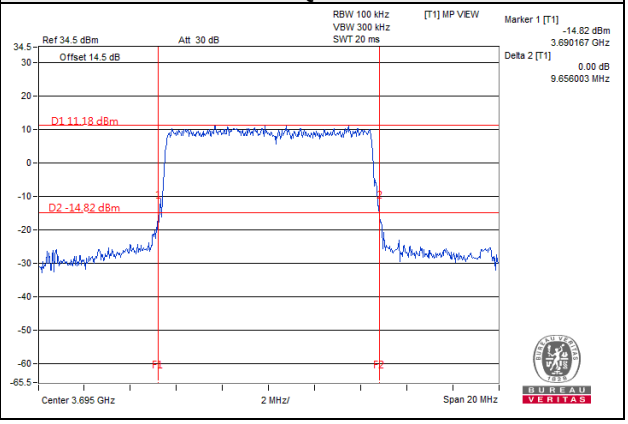
4.3.7 Test Result (-26dB Bandwidth)

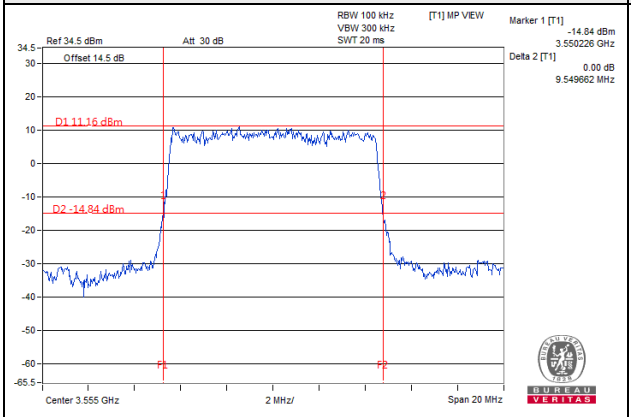
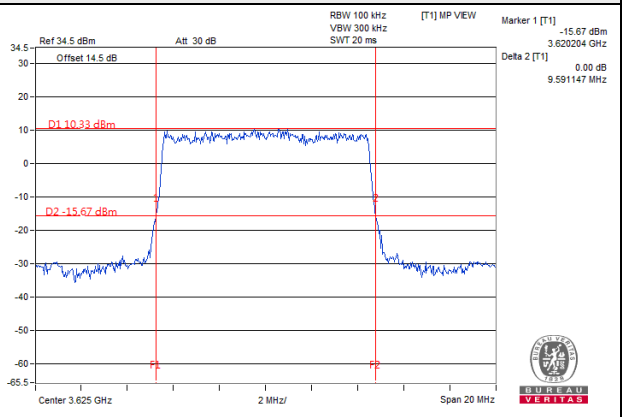
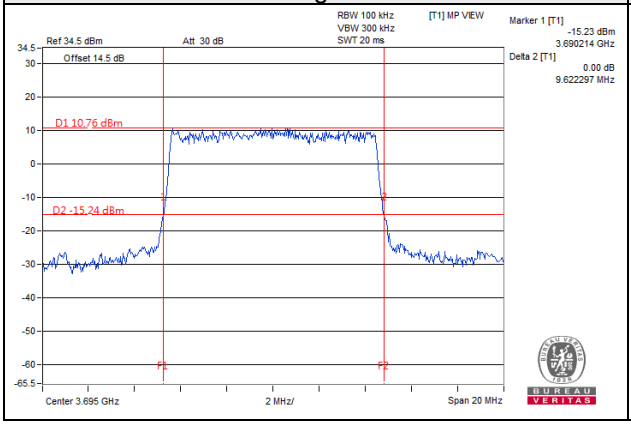
5MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

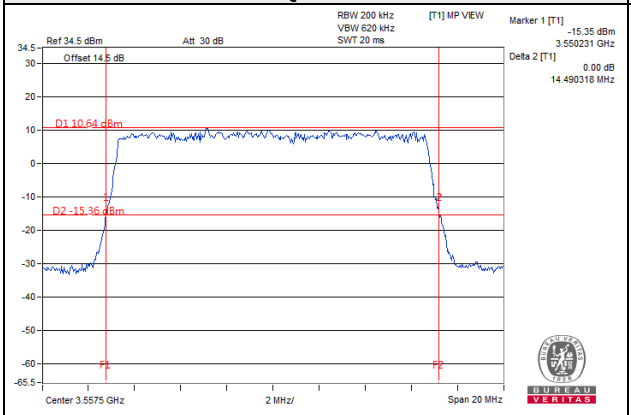
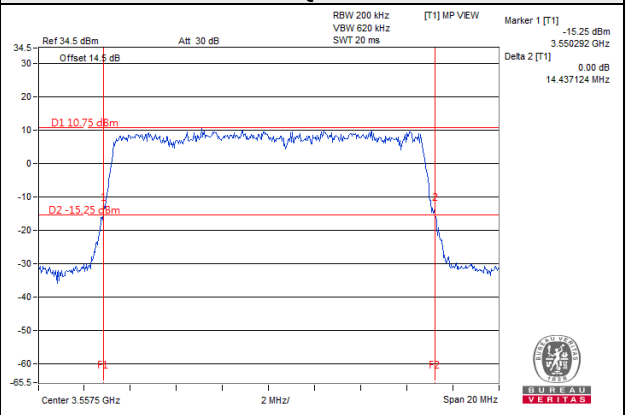
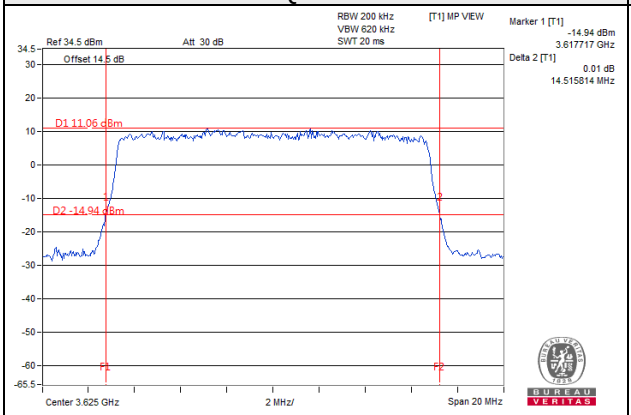
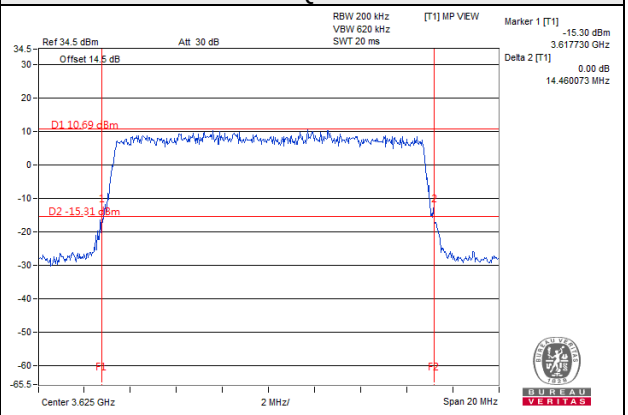
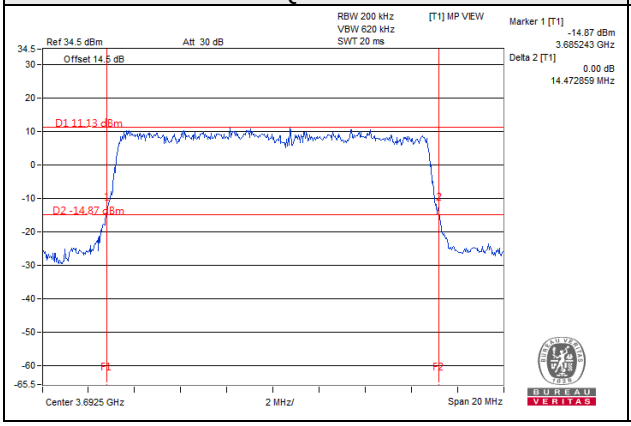
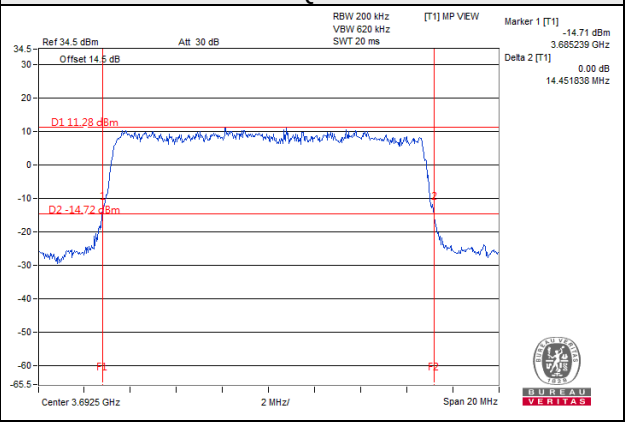
Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

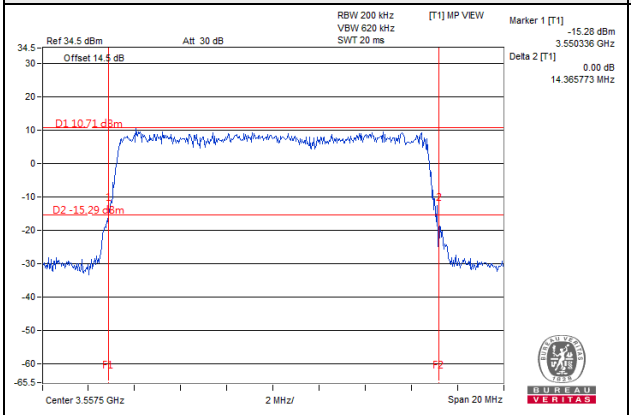
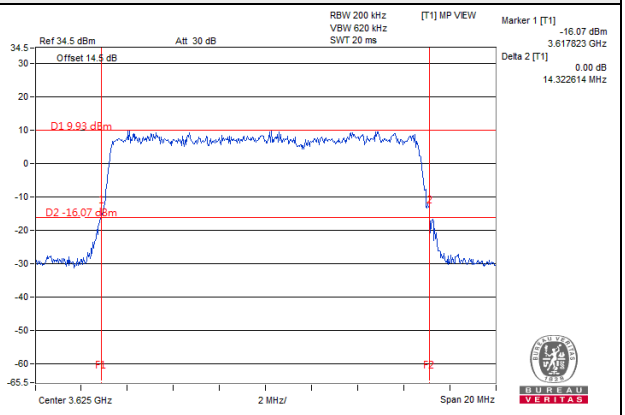
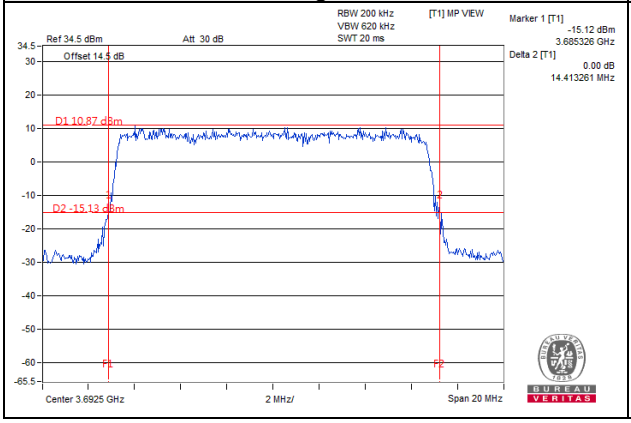
10MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

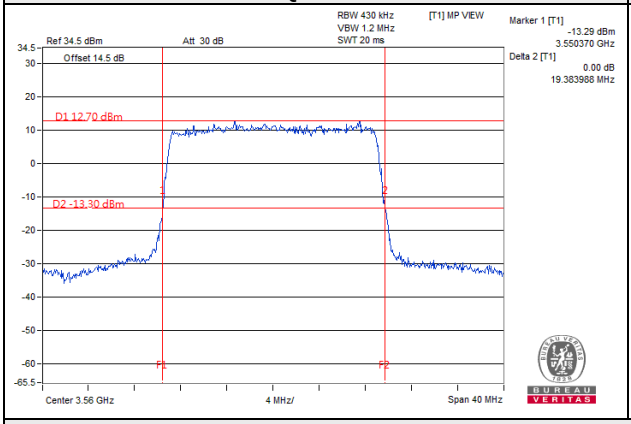
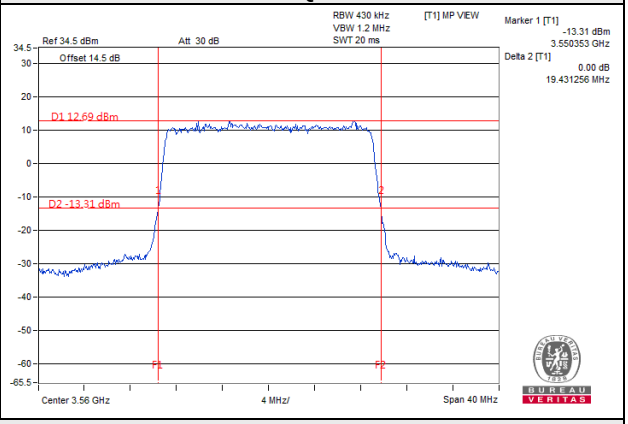
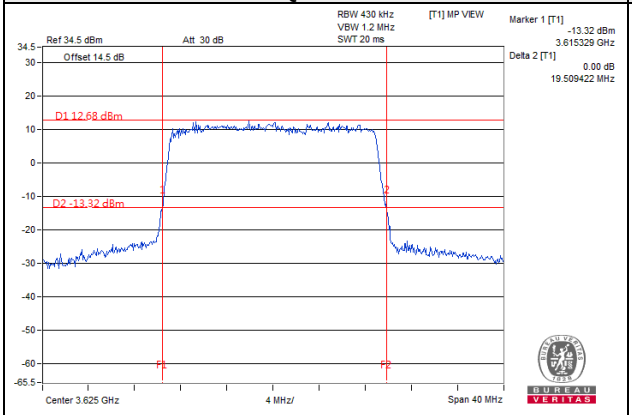
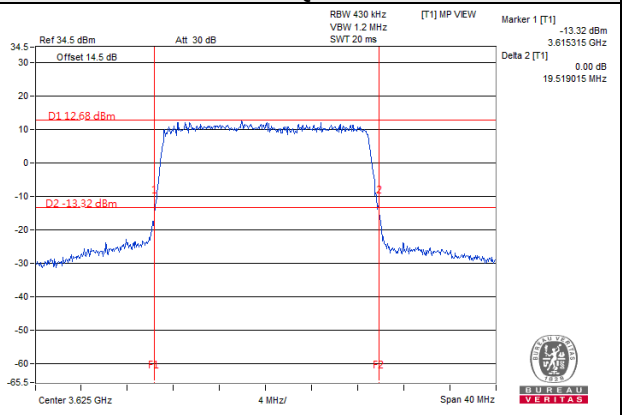
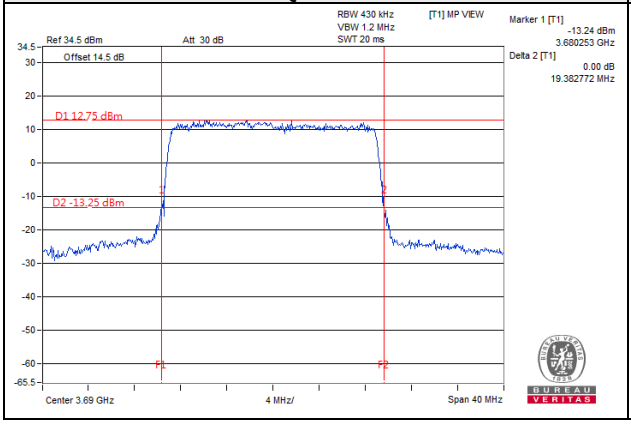
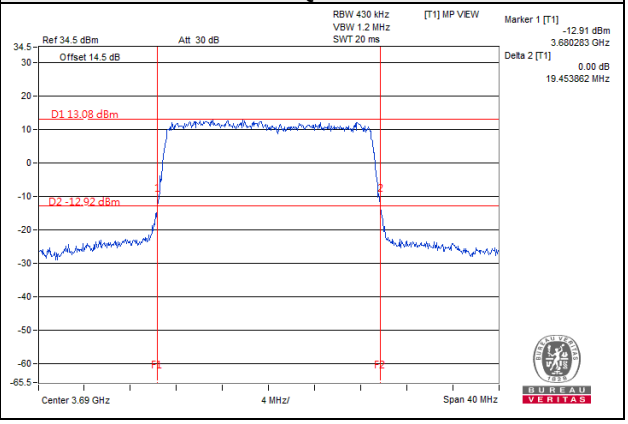
Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

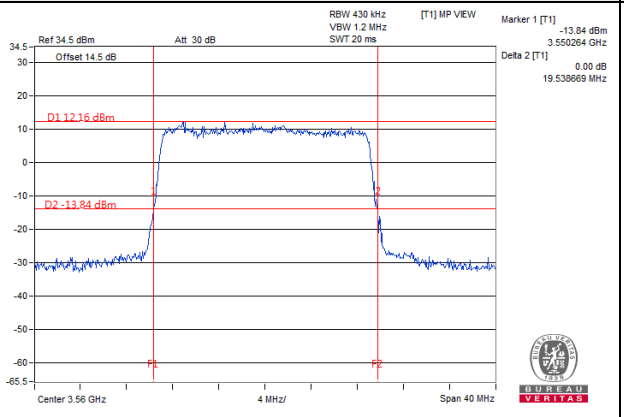
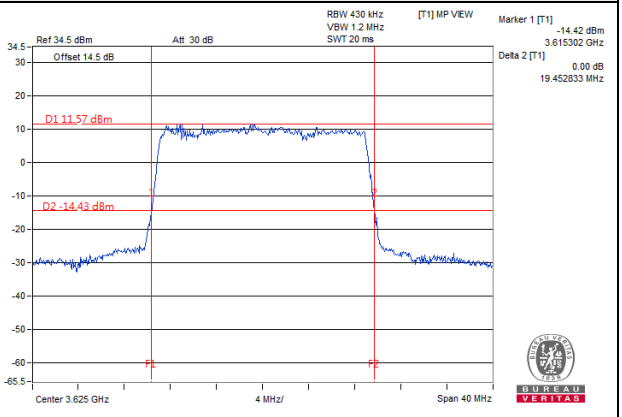
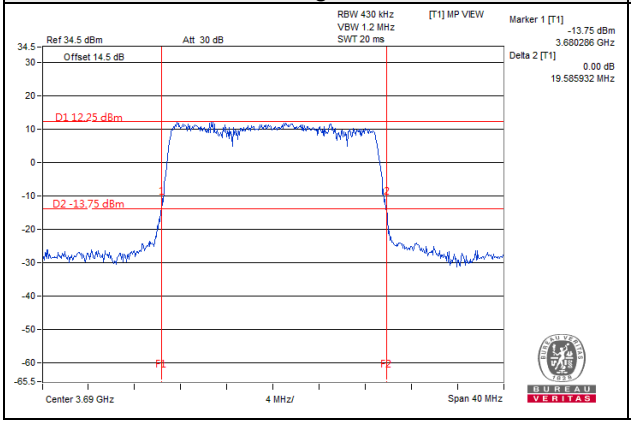
15MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

20MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

4.3.8 Test Result (Occupied Bandwidth)

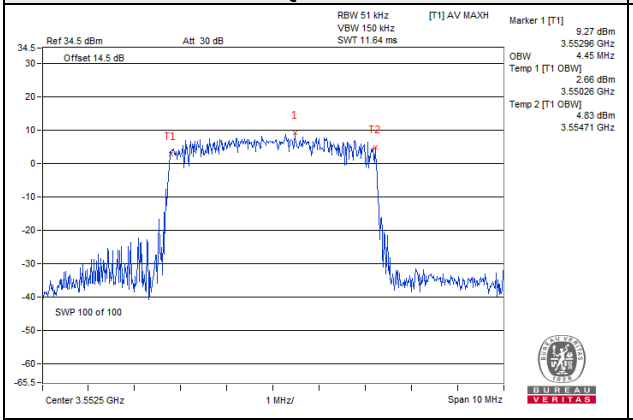
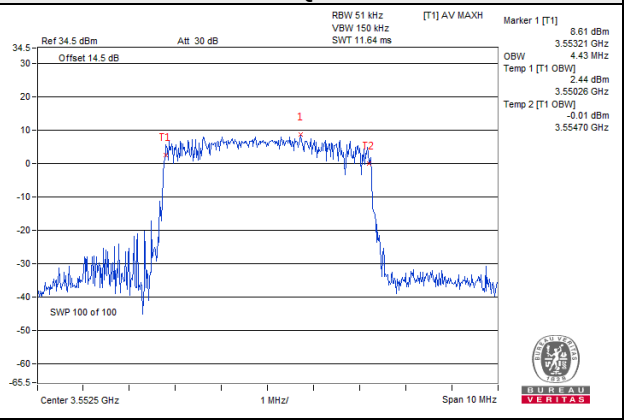
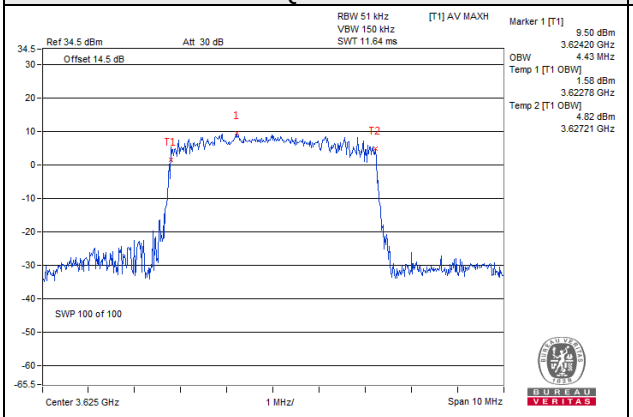
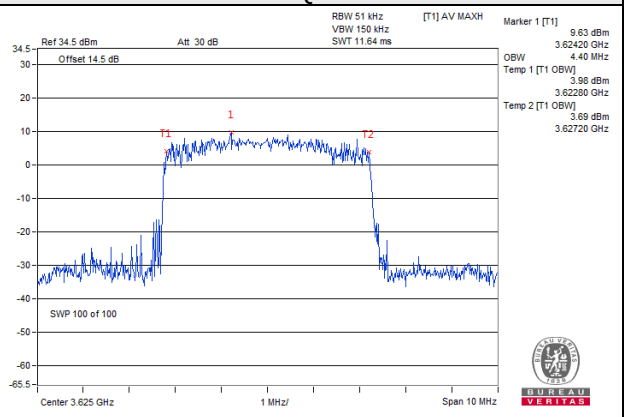
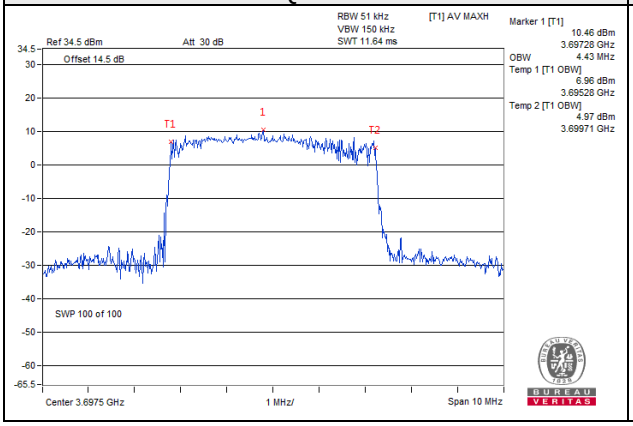
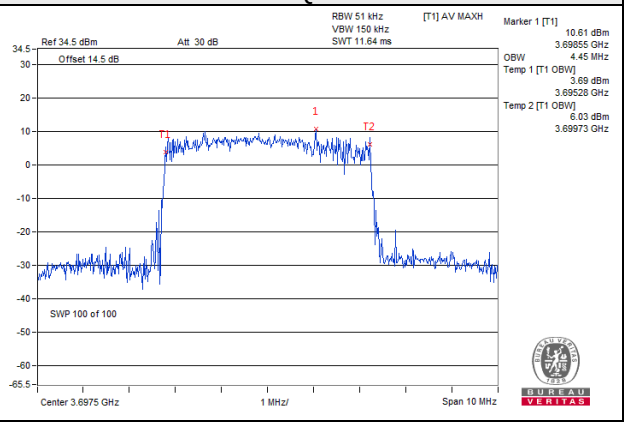
Channel	Freq. (MHz)	OCP 99 Band Width (MHz)		
		5MHz		
		QPSK	16QAM	64QAM
Low	3552.5	4.45	4.43	4.45
Middle	3625	4.43	4.40	4.45
High	3697.5	4.43	4.45	4.43

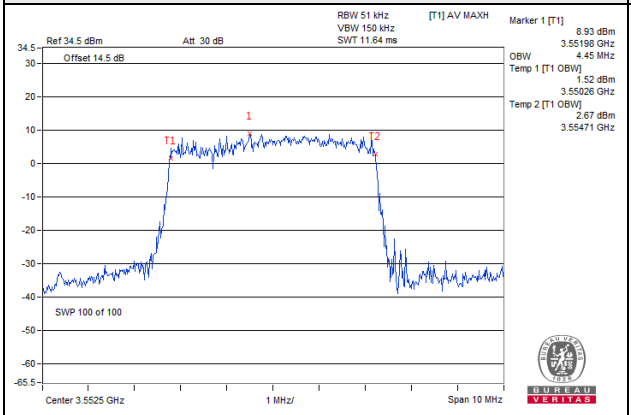
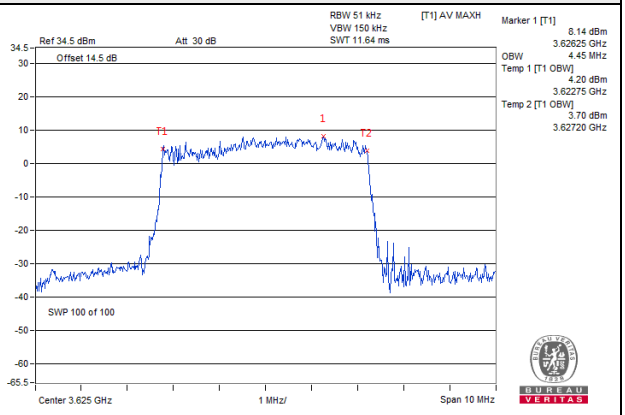
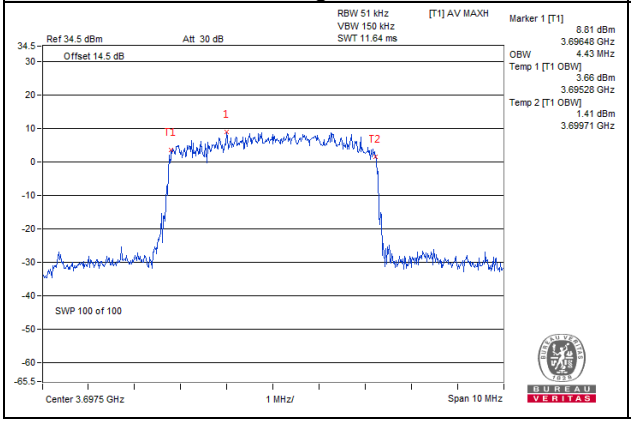
Channel	Freq. (MHz)	OCP 99 Band Width (MHz)		
		10MHz		
		QPSK	16QAM	64QAM
Low	3555	8.96	8.96	8.93
Middle	3625	8.96	8.96	8.90
High	3695	8.96	8.96	8.90

Channel	Freq. (MHz)	OCP 99 Band Width (MHz)		
		15MHz		
		QPSK	16QAM	64QAM
Low	3557.5	13.40	13.40	13.40
Middle	3625	13.36	13.43	13.36
High	3692.5	13.43	13.43	13.40

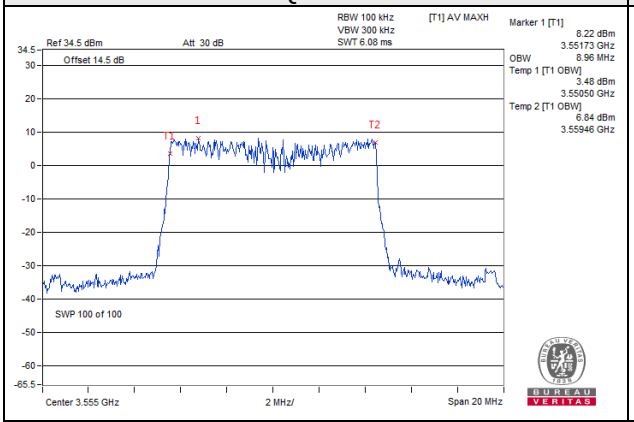
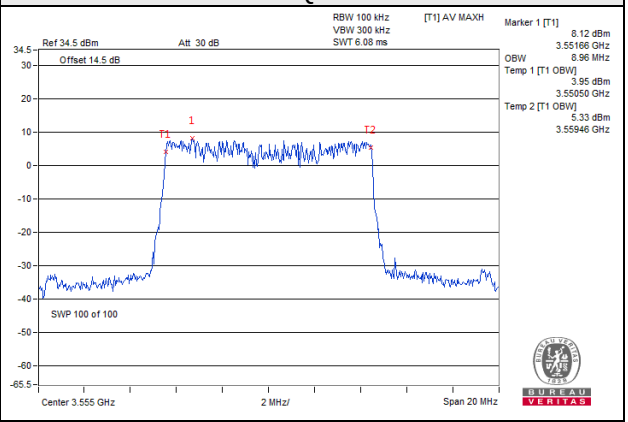
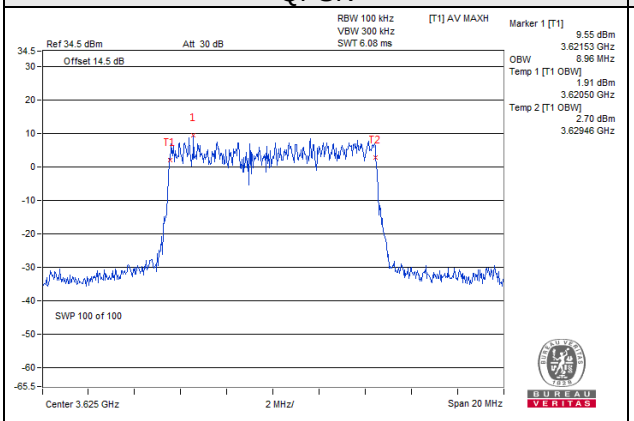
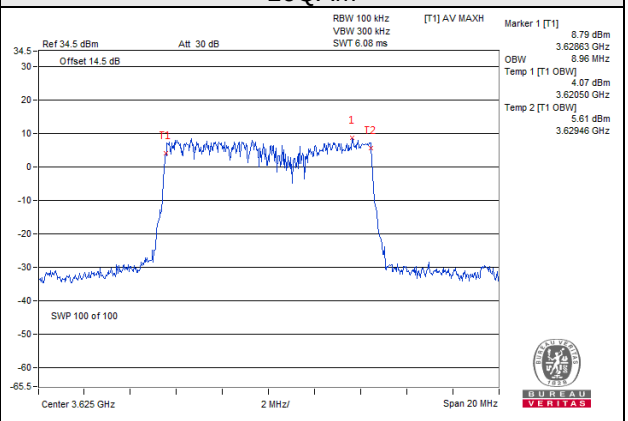
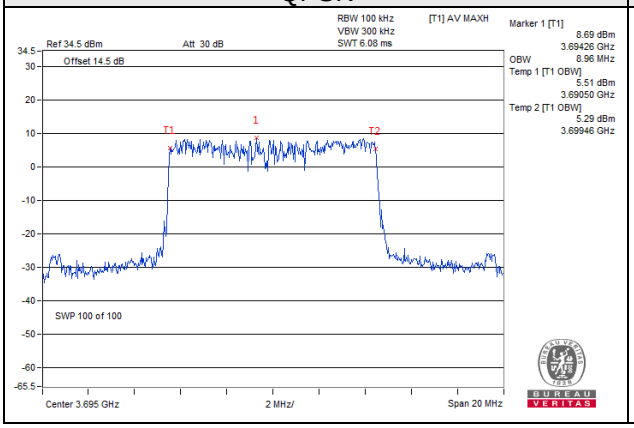
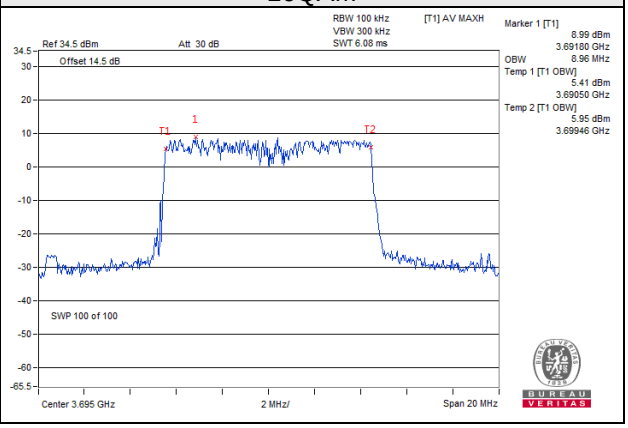
Channel	Freq. (MHz)	OCP 99 Band Width (MHz)		
		20MHz		
		QPSK	16QAM	64QAM
Low	3560	17.93	17.93	17.86
Middle	3625	17.93	17.86	17.93
High	3690	18.00	17.93	17.93

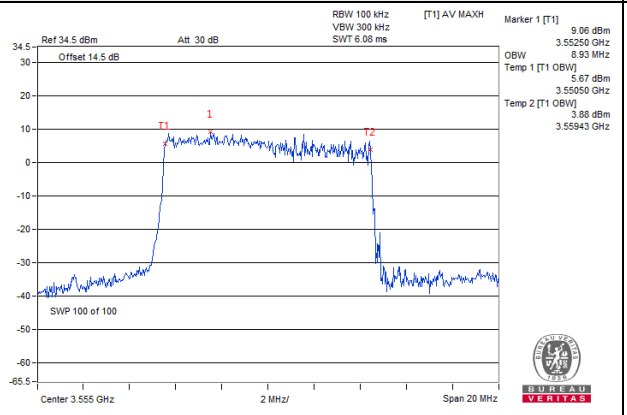
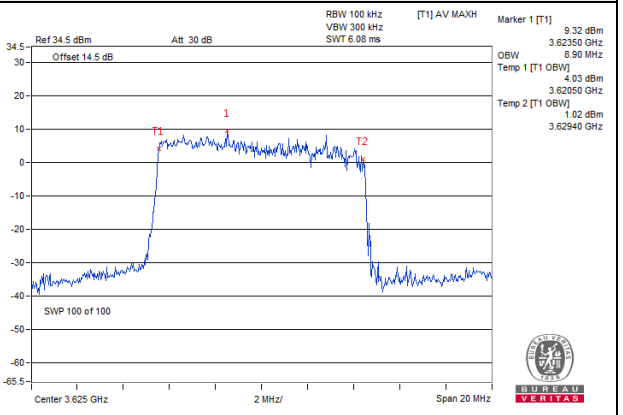
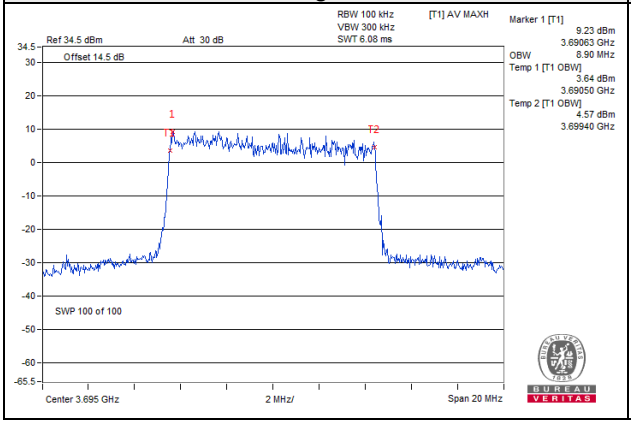
5MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

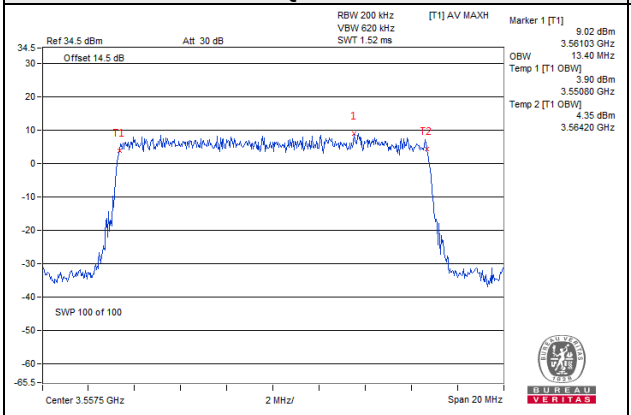
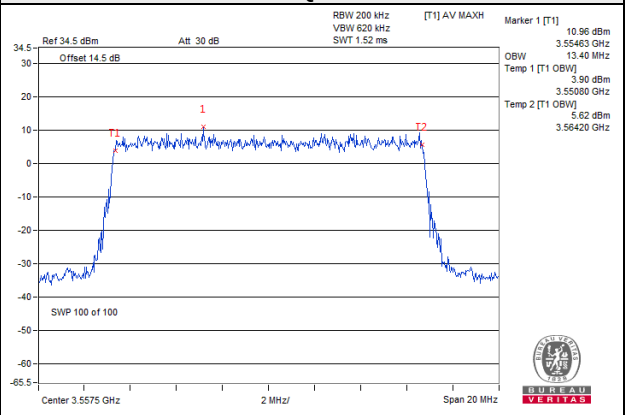
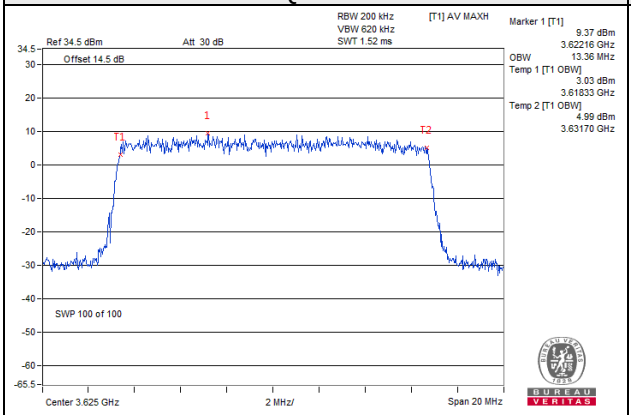
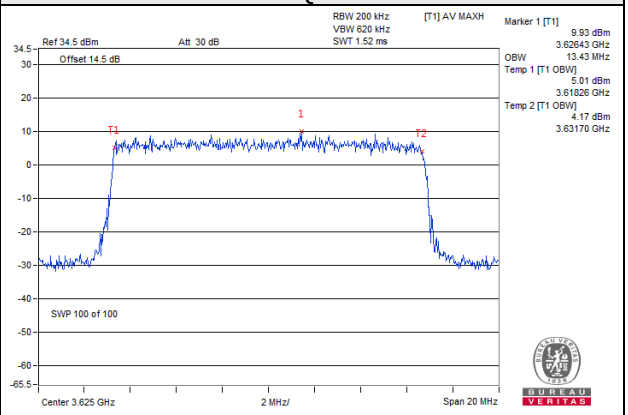
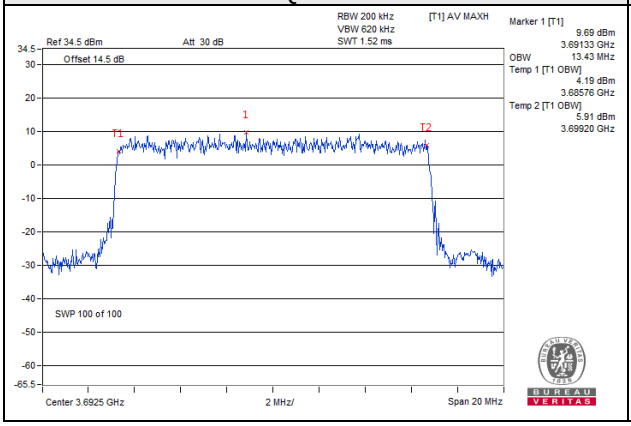
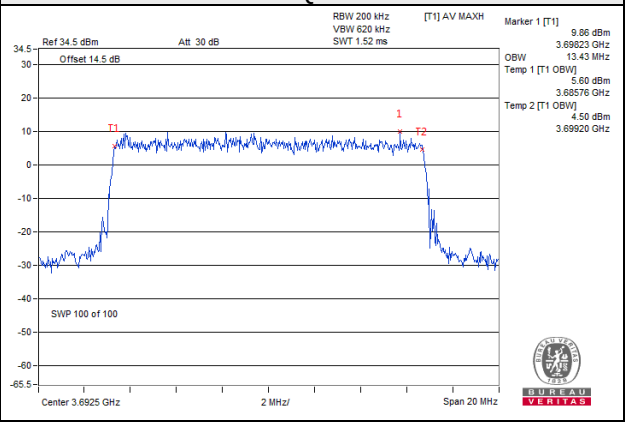
Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

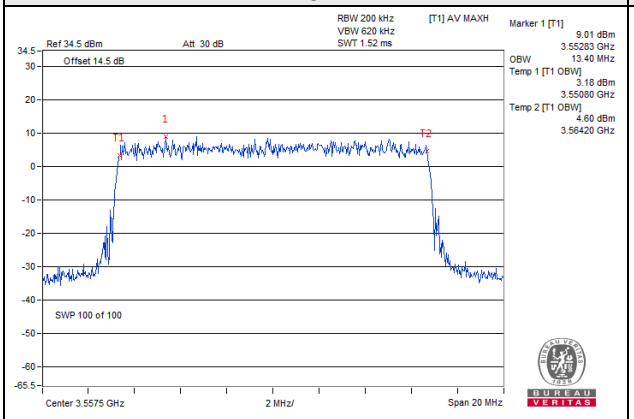
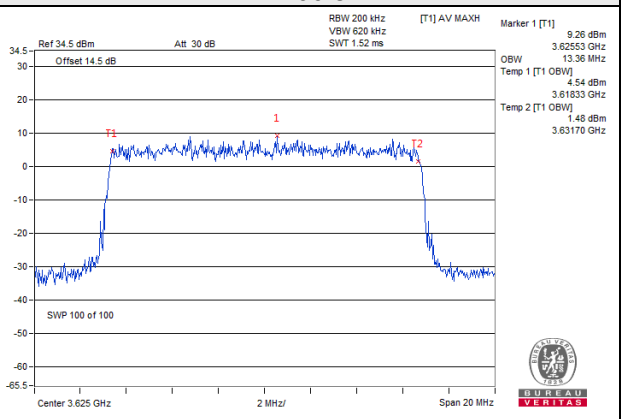
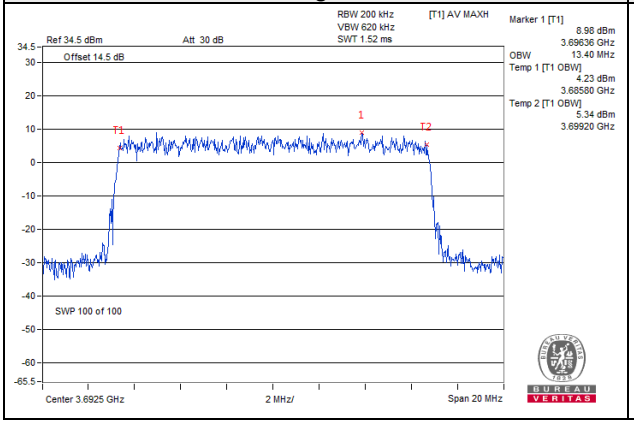
10MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

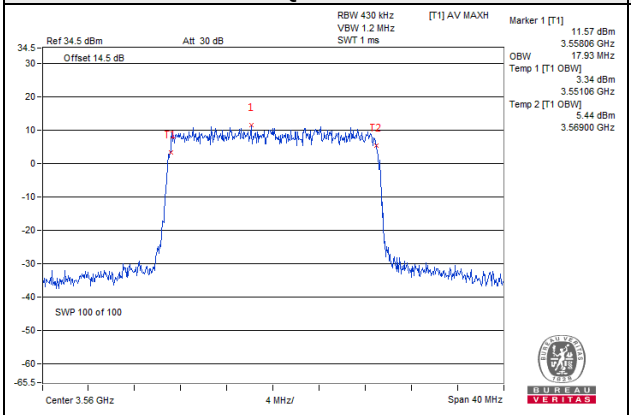
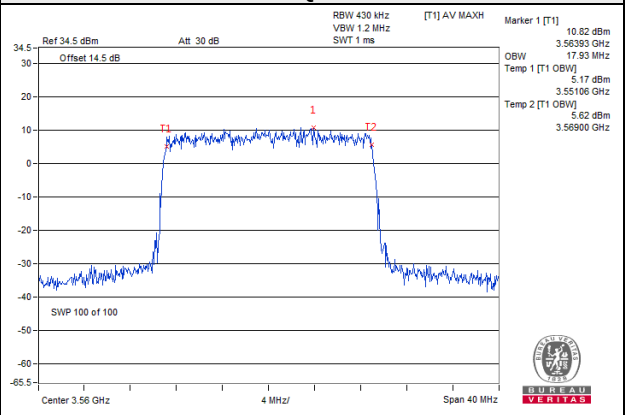
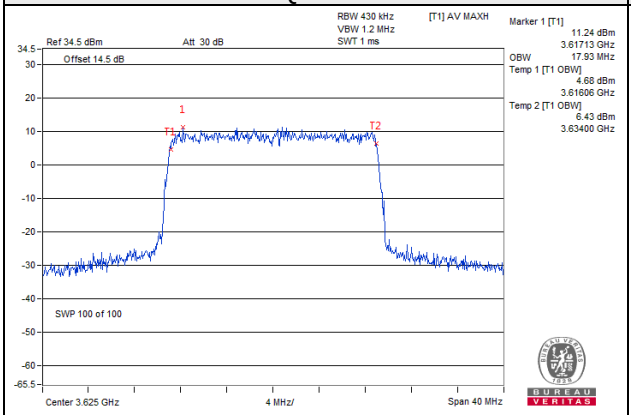
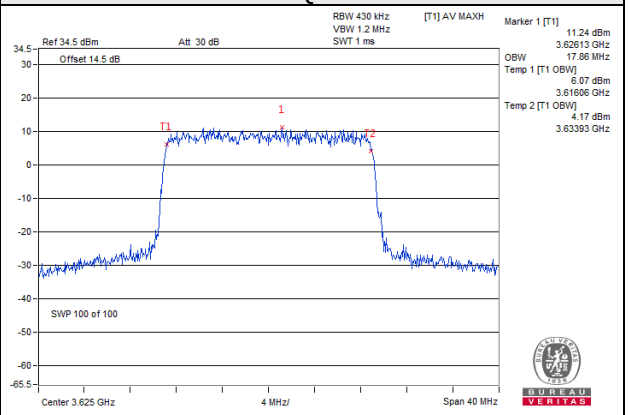
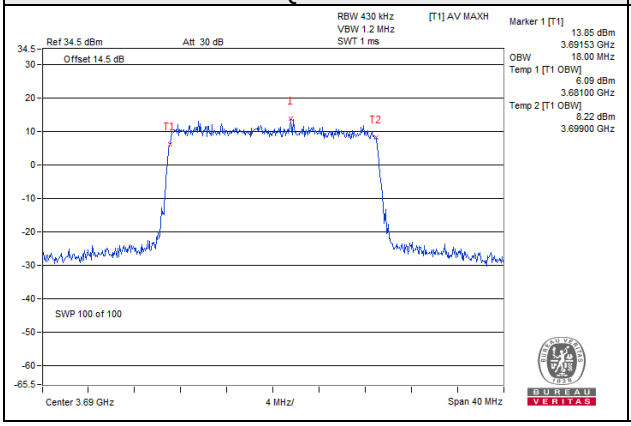
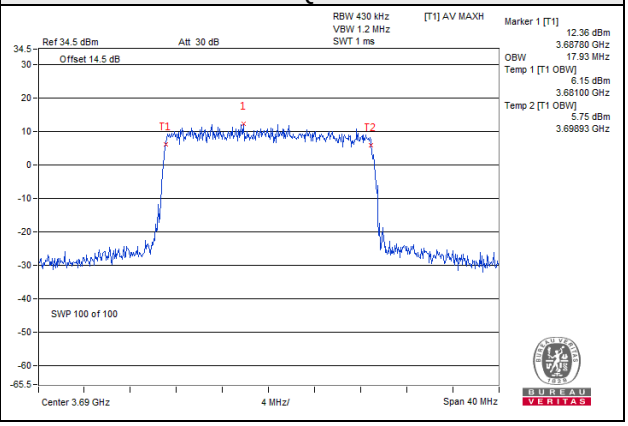
Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

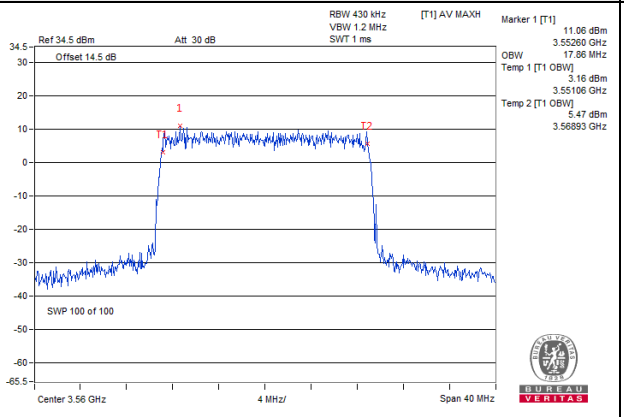
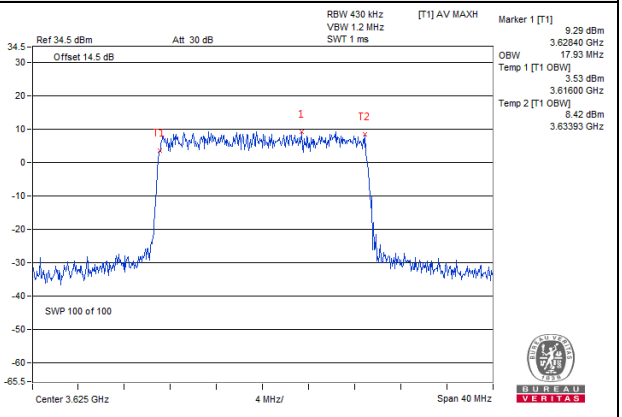
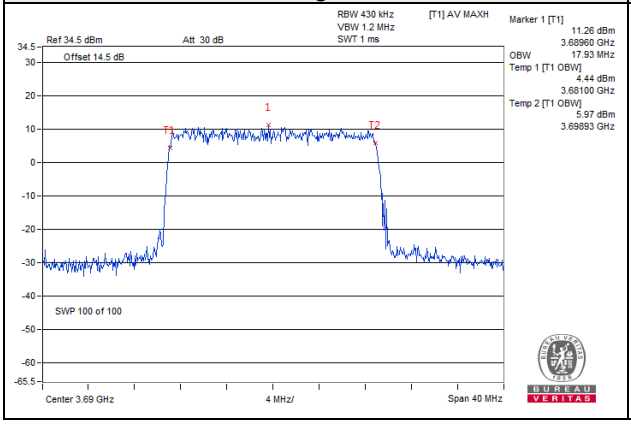
15MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

20MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

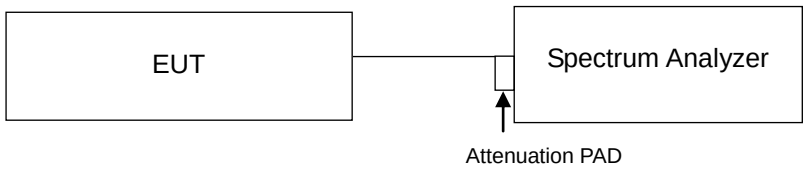
Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

4.4 96.41(B)

4.4.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.4.2 Test Setup



4.4.3 Test Procedures

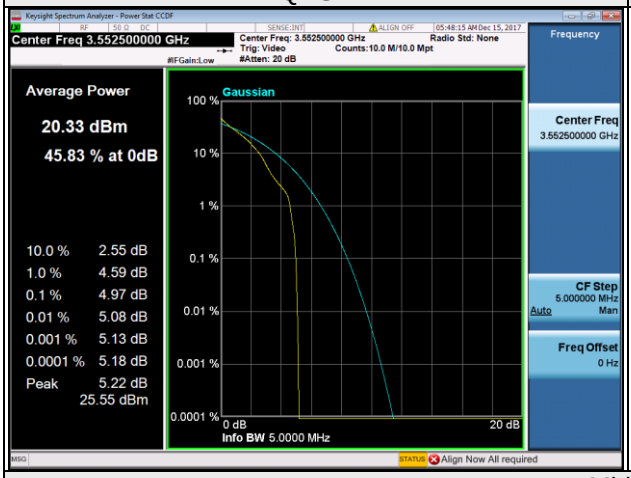
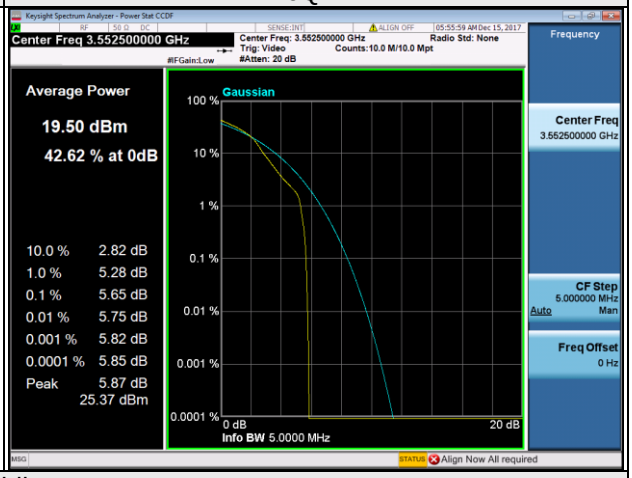
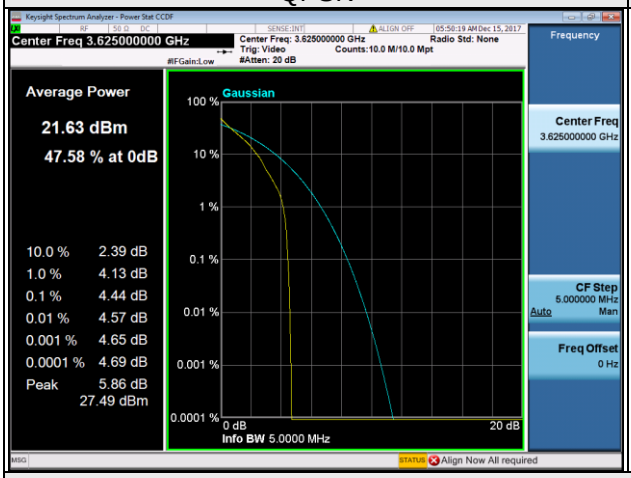
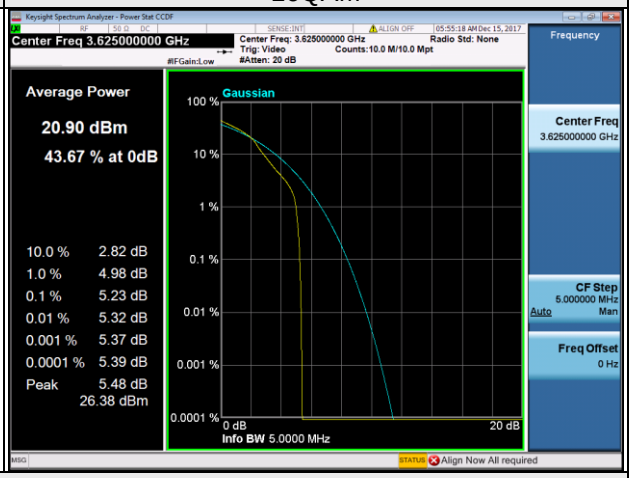
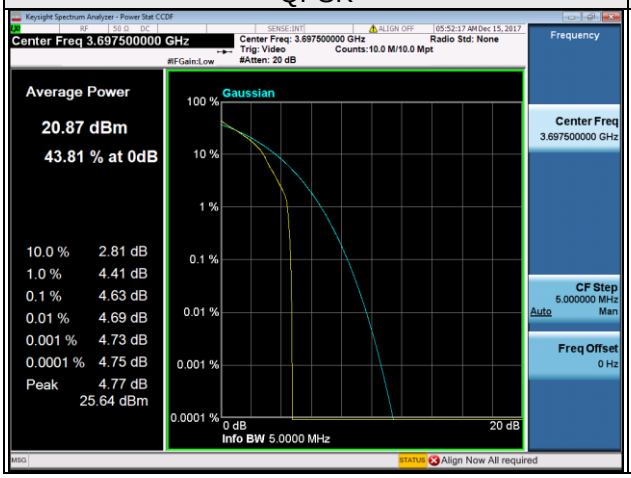
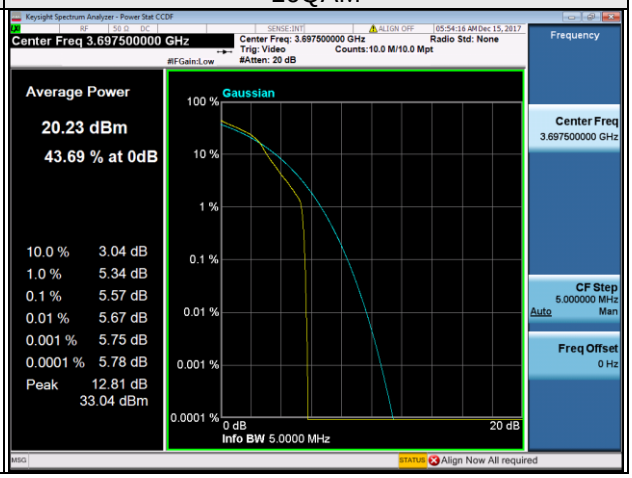
a. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

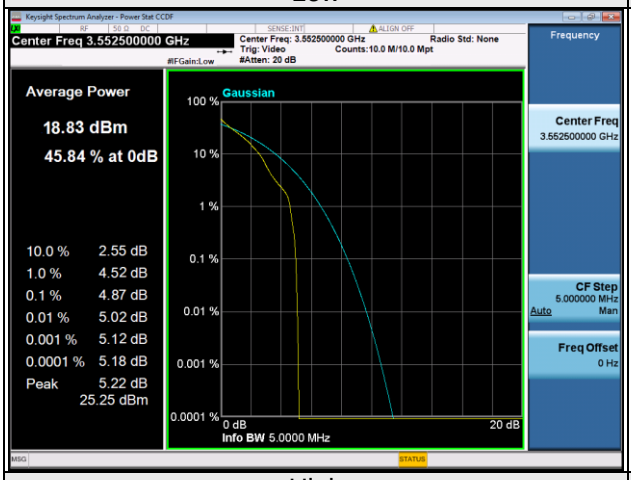
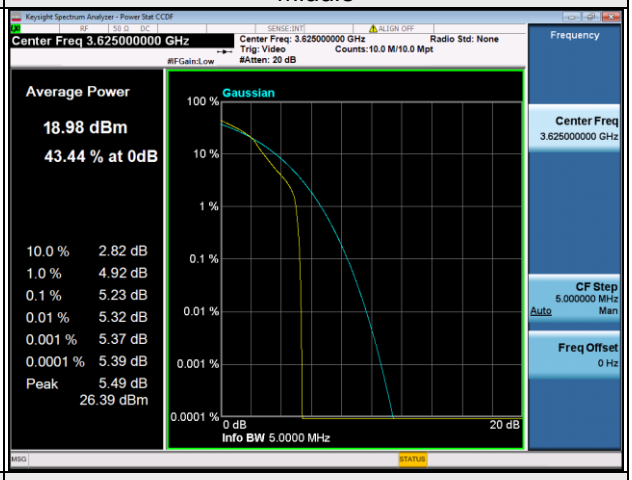
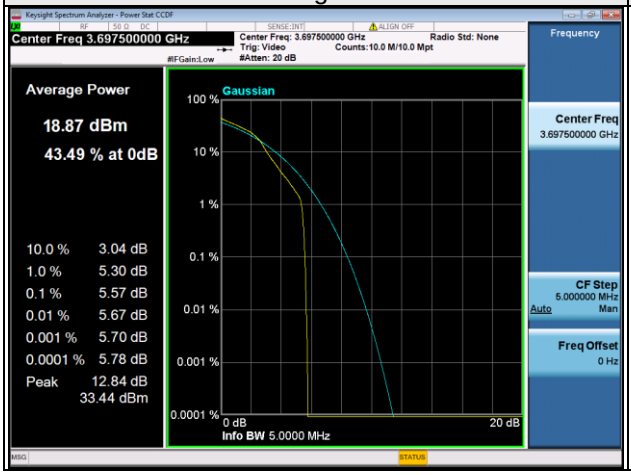
b. Set the number of counts to a value that stabilizes the measured CCDF curve;

c. Record the maximum PAPR level associated with a probability of 0.1%.

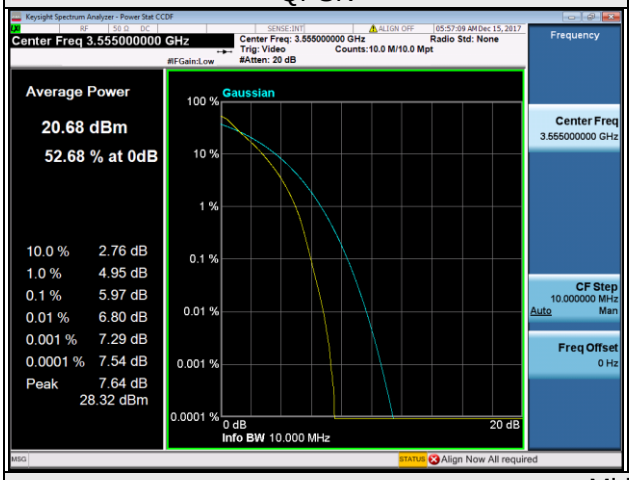
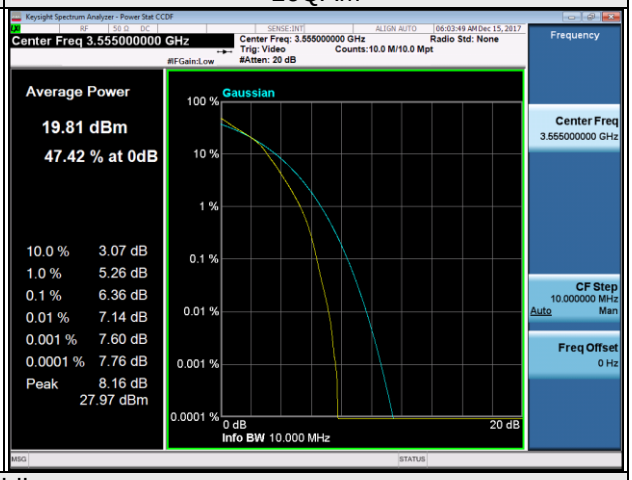
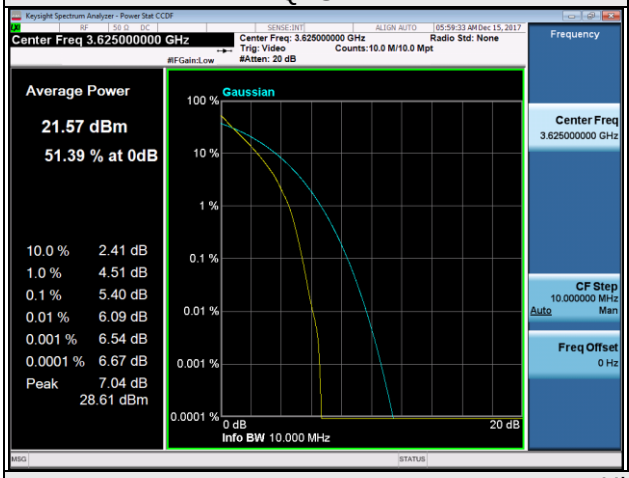
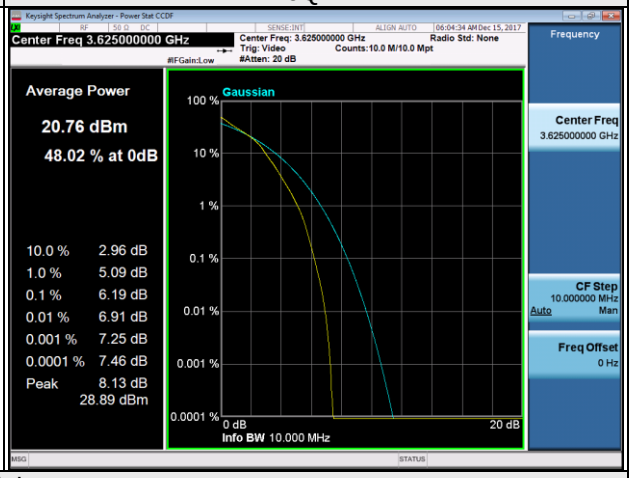
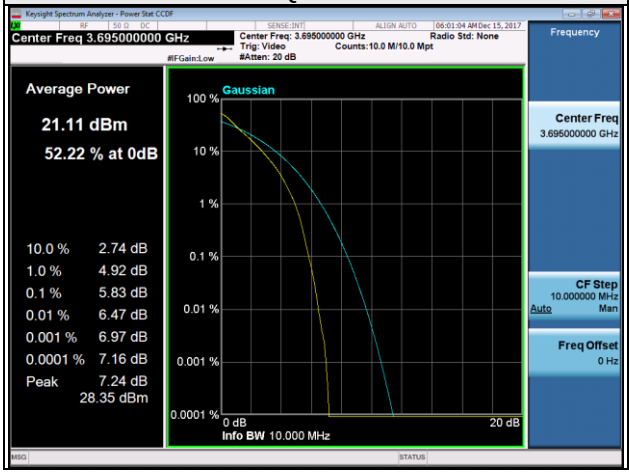
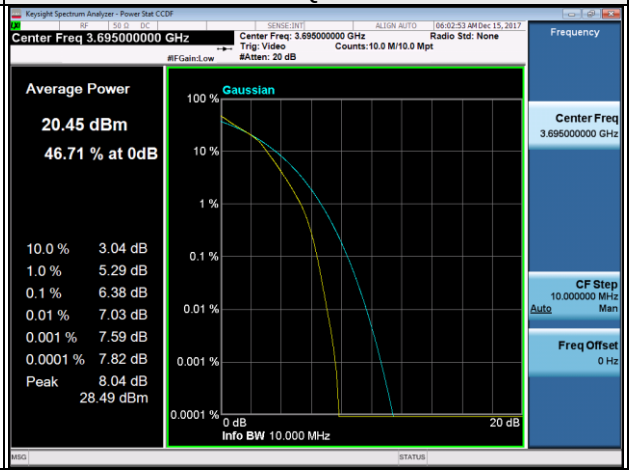
4.4.4 Test Results

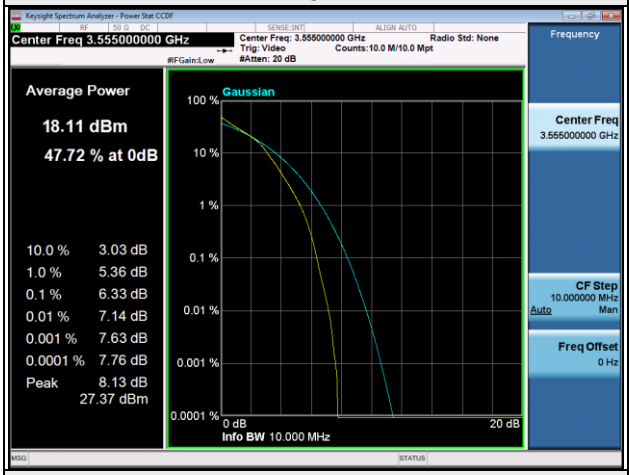
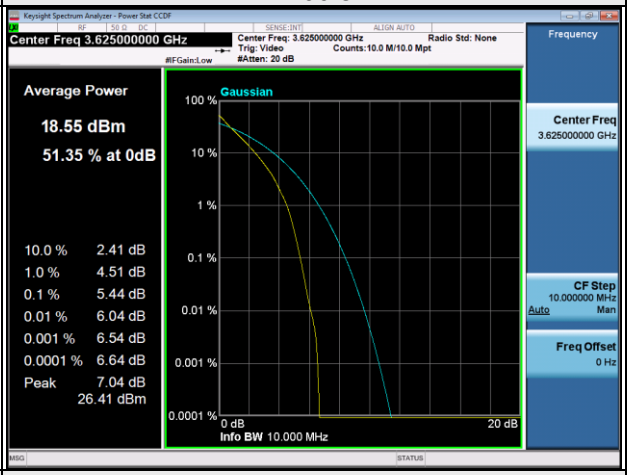
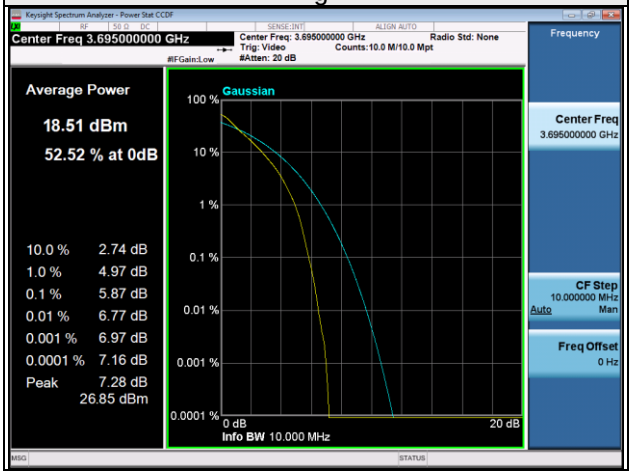
5MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

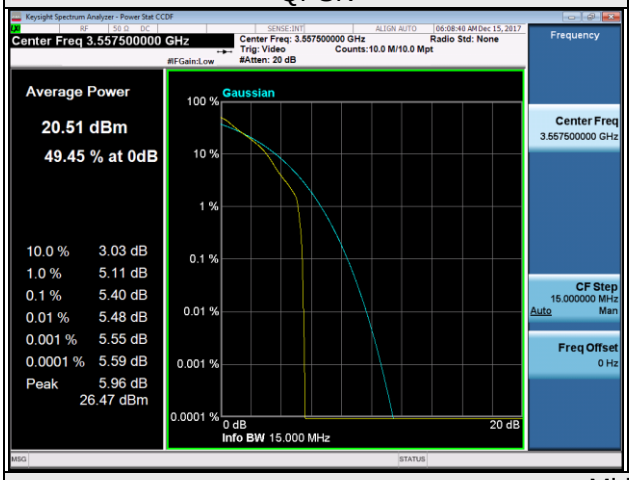
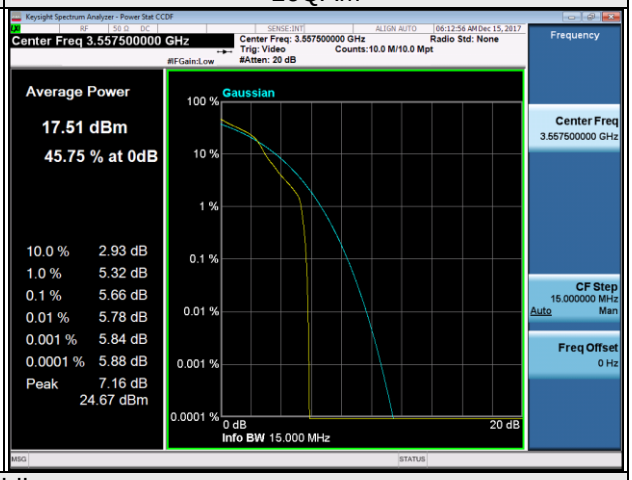
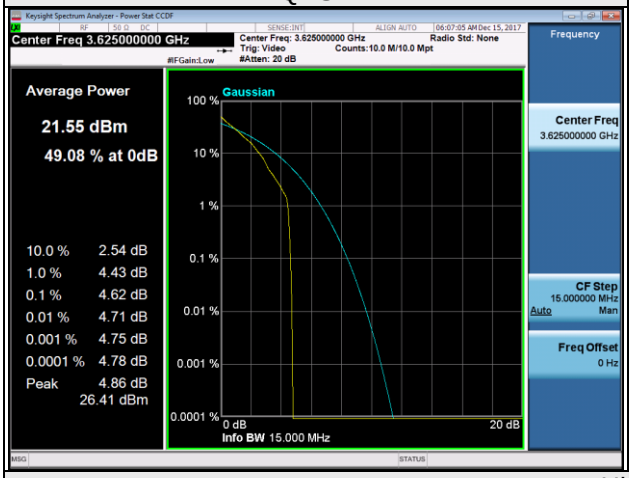
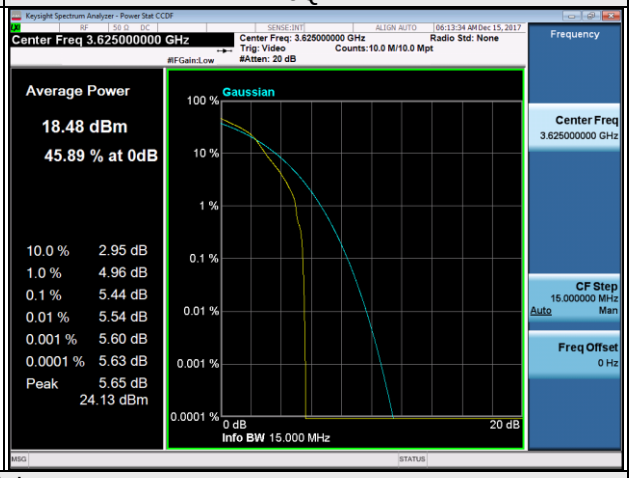
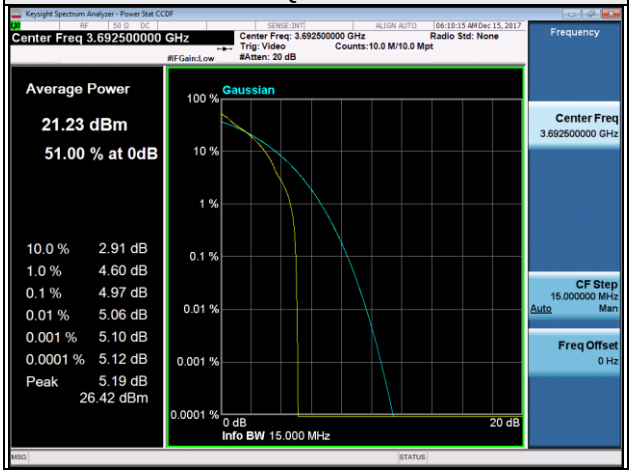
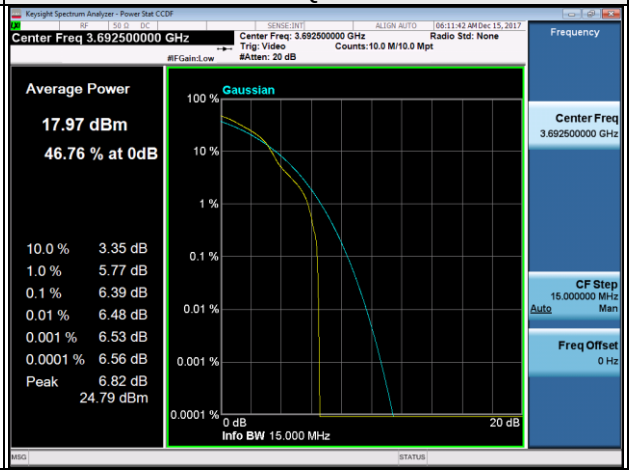
Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

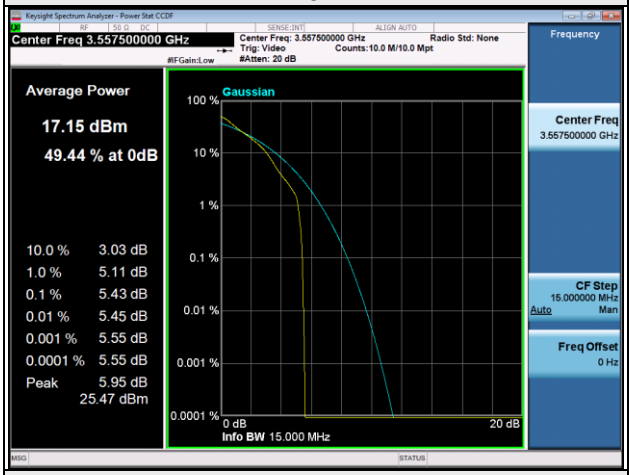
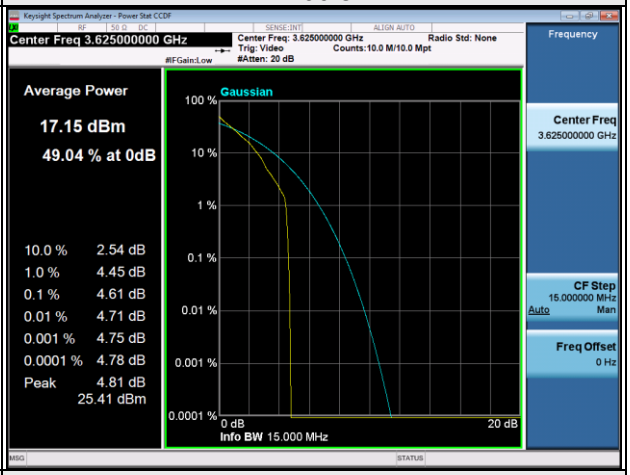
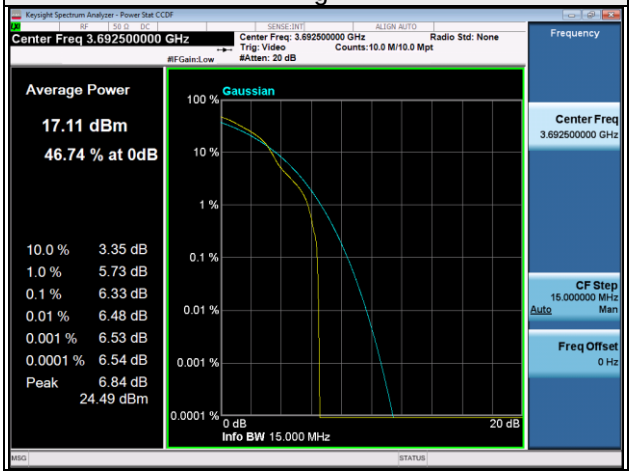
10MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

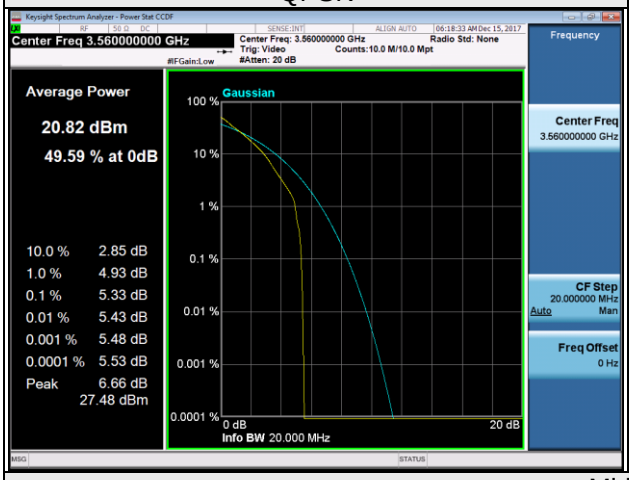
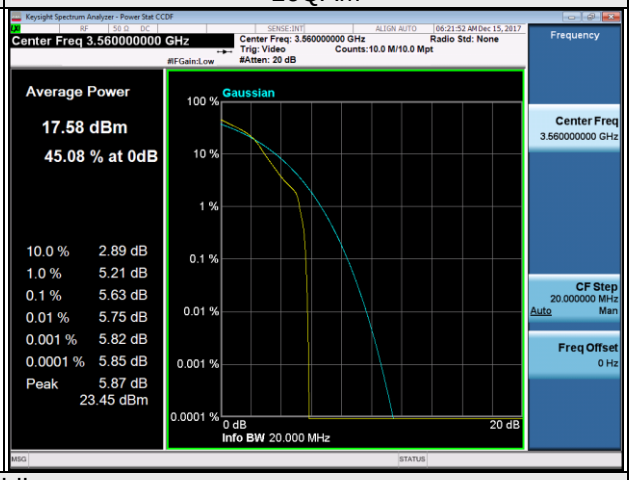
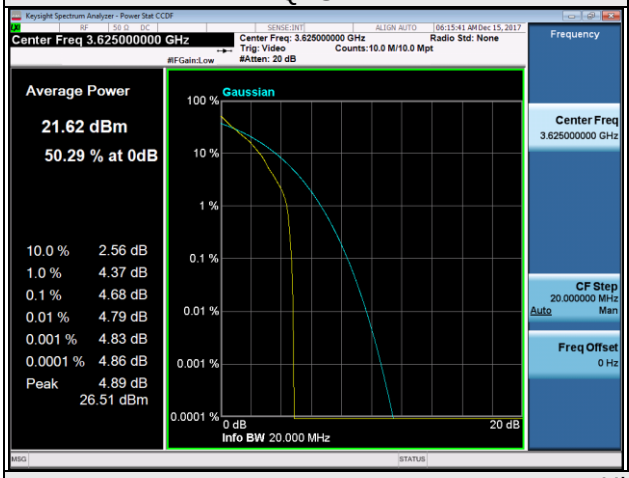
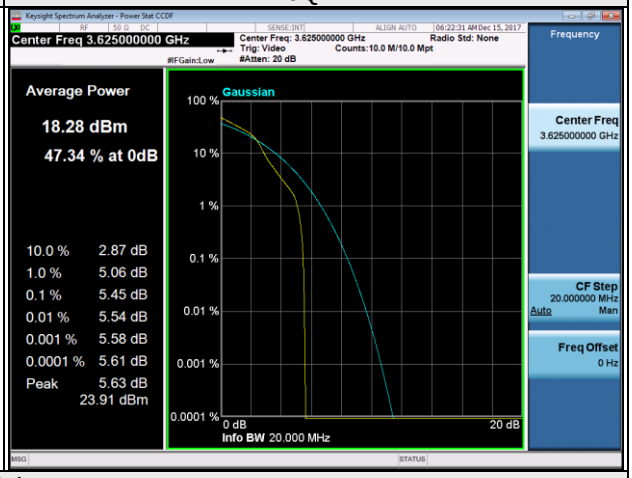
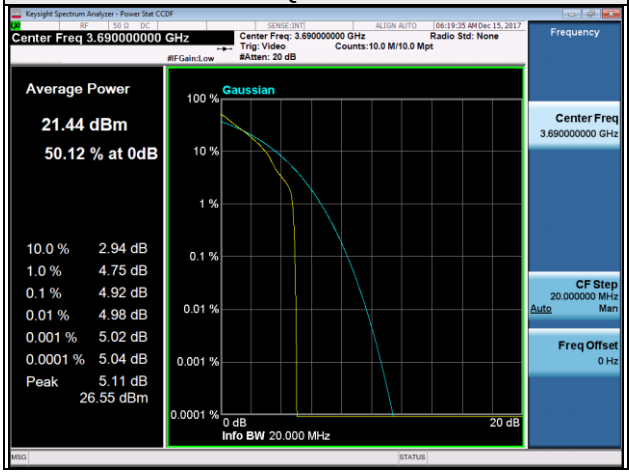
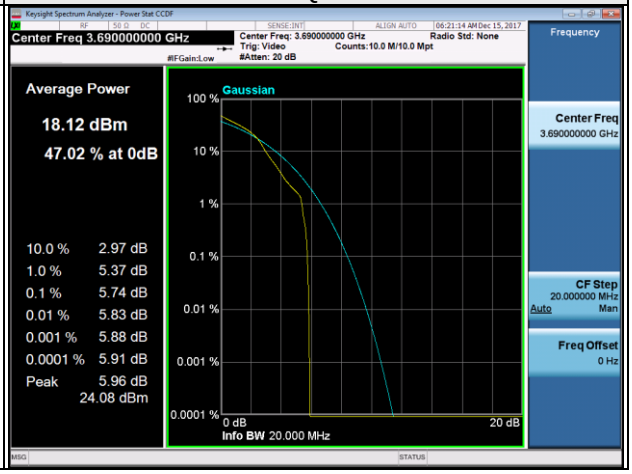
Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

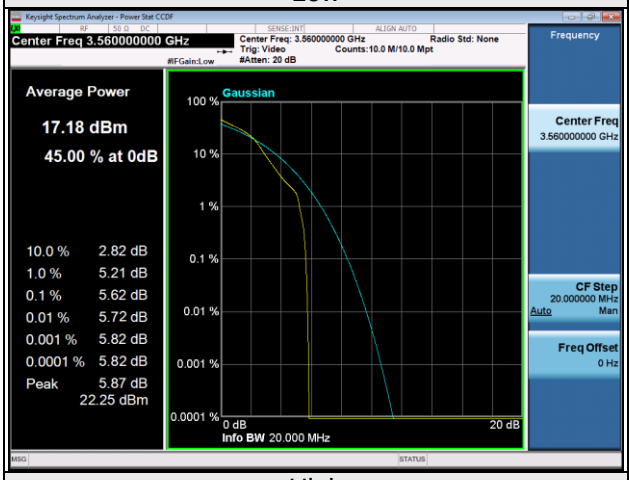
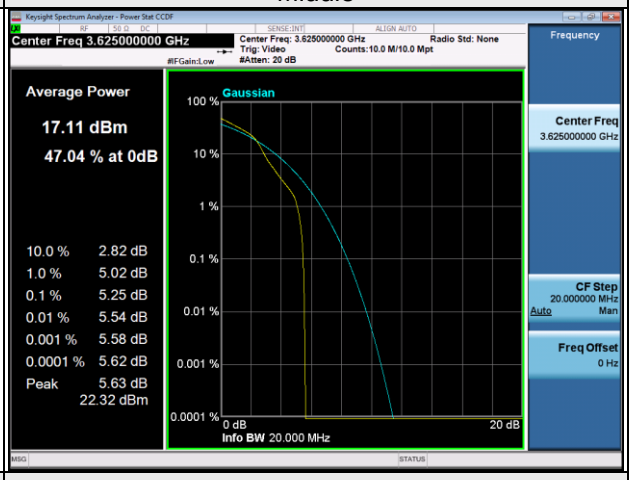
15MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High	
	

20MHz:

Spectrum Plot Of Worst Value	
Low	
QPSK	
QPSK	16QAM
	
Middle	
QPSK	
QPSK	16QAM
	
High	
QPSK	
QPSK	16QAM
	

Spectrum Plot Of Worst Value	
QPSK	
64QAM	
Low	Middle
	
High